

22/8

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APR 13 1919

Rock Products

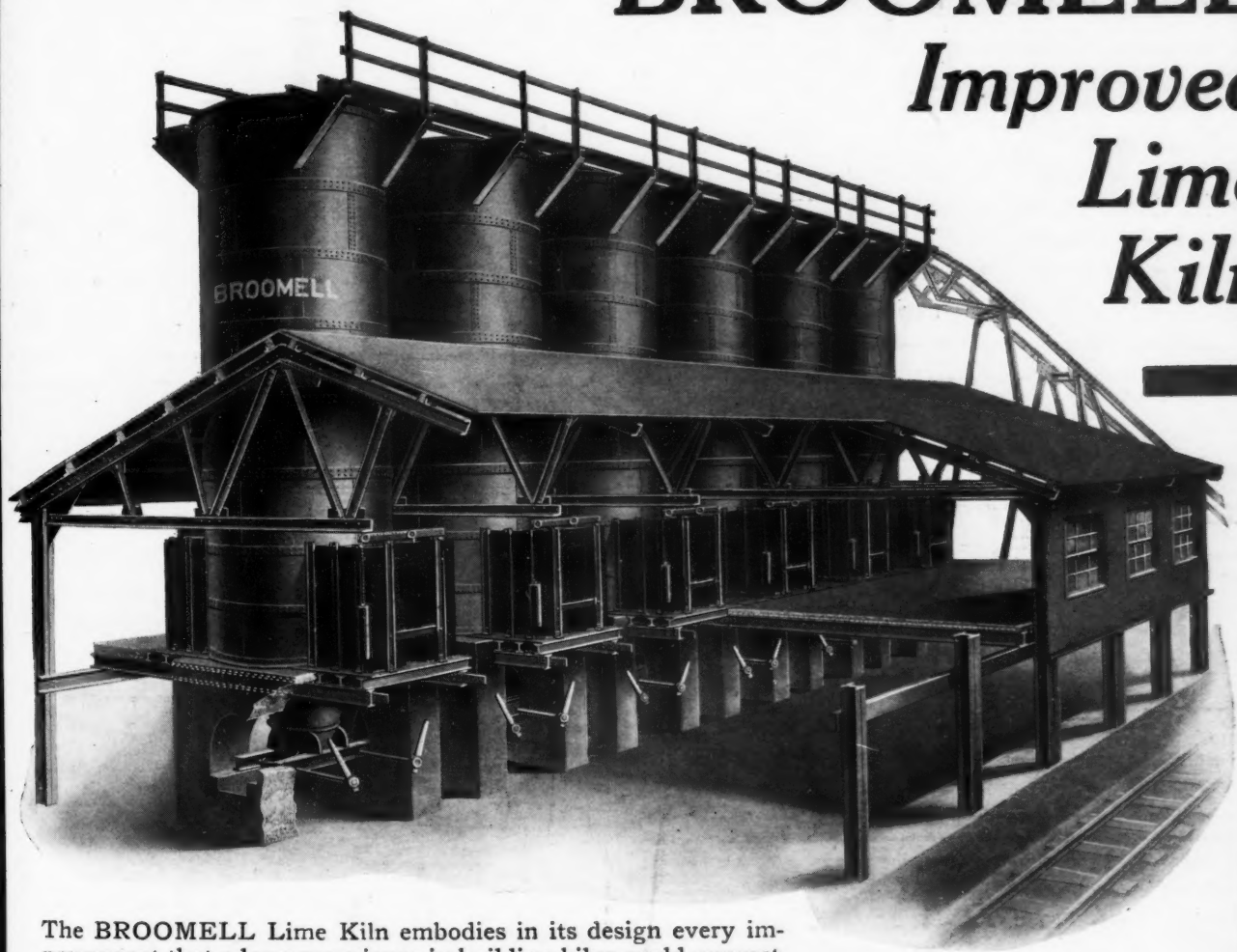
\$2.00 A YEAR

CHICAGO

APRIL 12, 1919

BROOMELL

Improved Lime Kiln



The BROOMELL Lime Kiln embodies in its design every improvement that a long experience in building kilns could suggest. It can be erected with unskilled labor at minimum cost. All joints of plates are covered with butt straps adding greatly to strength. No riveting. Furnaces are of improved design giving long life to the brick lining. Hearth plates for the furnaces are carried on cross beams which rest on 12 in. beams extending in one piece through the piers. These beams can be extended to carry the floor. Cooling Cones are provided with a heavy Cast Iron sub-

cone at bottom. The sub-cone rests on heavy I Beams thus taking all weight off of the cone sole plate. Discharging gates are of improved pattern and run on anti-friction rollers. Send for Booklet.

A. P. Broomell, Manufacturer, York, Pa., U. S. A.



for 5 years the elements tried to destroy it—but today it is as good as new

A Keystone Kiln has stood—with top uncovered—since 1914 at a deserted quarry of the Montgomery Lime Company in Houchins, Va.

Today it is being moved sixty miles to a new location by the Kimbalton Lime Co. It is as good as new!

So satisfactory was its performance during the nine years of actual use that the Kimbalton Lime Co. has ordered a sister kiln to meet increased-production plans.

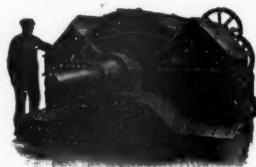
Keystone Kilns

Here you have proof of singular durability and working merit. And note that the Keystone can be moved. This can be done with no other kiln.

234 Kilns in Use to Date

Stacey-Schmidt Manufacturing Co.
York, Penna.

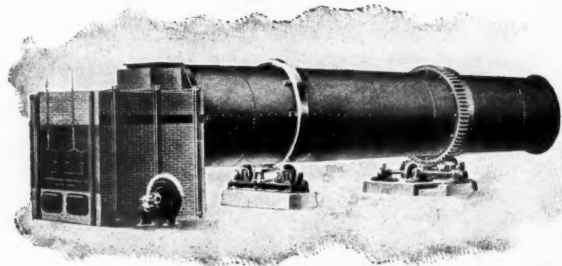
"PENNSYLVANIA" Hammer Crushers



PATENTED

For Crushing and Pulverizing Lime, Limestone, Gypsum, Marl, Shale, Etc. Main Frame of Steel, "Ball and Socket" Self Aligning Bearings; forged Steel Shaft; Steel Wear Liners; Cage adjustable by hand wheel while Crusher is running. No other hammer Crusher has such a big Safety Factor.

Pennsylvania Crusher Company
New York PHILADELPHIA Pittsburgh



DRYERS

AMERICAN PROCESS CO. 68 Williams Street
NEW YORK CITY



ATTENTION

Cement Manufacturers
and Supply Dealers

If you will examine your cement that was packed in Jaite Bags over the winter months you will find the cement in better condition than cement packed in other paper or cotton bags.

Ours Excludes the Moisture

THE JAITE CO.

JAITE, OHIO
Sole Manufacturers

BROWNING LOCOMOTIVE CRANES

"The All-Around Champions"

BROWNING
"Buckets That Bite"

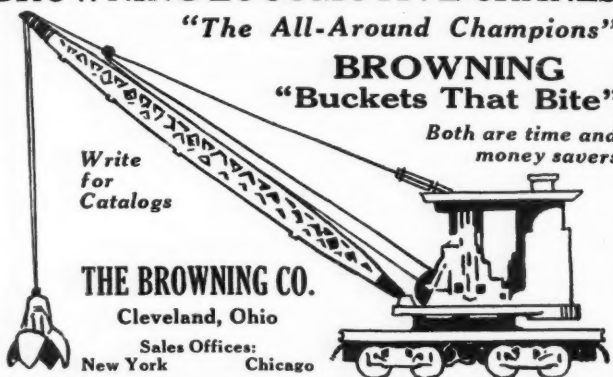
Both are time and money savers

Write
for
Catalogs

THE BROWNING CO.

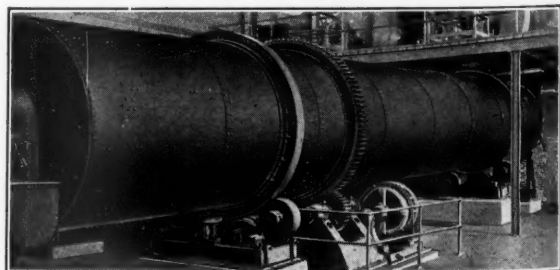
Cleveland, Ohio

Sales Offices:
New York Chicago



Ruggles-Coles Dryers

for coal, clays, sand, stone, etc.
They will burn less fuel than any other type and with their low power and repair costs are most economical to operate.



Built to Dry at the Lowest Ultimate Cost

Ruggles-Coles Engineering Co.

McCormick Building
Chicago

50 Church Street
New York

WORKS: YORK, PENNSYLVANIA

For better service say, "I saw it in ROCK PRODUCTS"

Special—Trial Subscription Offer!!



**This Is the One Useful
Journal Dealing With**

Lime, Cement, Crushed Stone, Limestone, Sand and Gravel

and all products of the

Quarry, Pit and Bank

This journal covers every phase
of these industries—

Production, the Selling end, and
the Business side.

Technical matter on engineering, oper-
ation, machinery, etc., is highly prac-
tical, written in plain English, with a
multitude of pictures.

Whatever is noteworthy in the industry finds a
place in ROCK PRODUCTS' pages, with spe-
cial attention to engineering features and oper-
ating economies.

MARKET PRICES

in every issue, arranged
according to locality. No
more guesswork as to
values.

A very useful journal, a very necessary journal,
to every ambitious man in the rock products
industries.

Rock Products, 542 So. Dearborn St., Chicago

ROCK PRODUCTS is published every other Wednesday by Trade Press Publishing Corporation, 542 So. Dearborn St., Chicago. Subscription: \$2.00 a year in the United States, \$3.00 in Canada. Entered as second class matter July 2, 1907, at the post office in Chicago, under act of March 3, 1879.

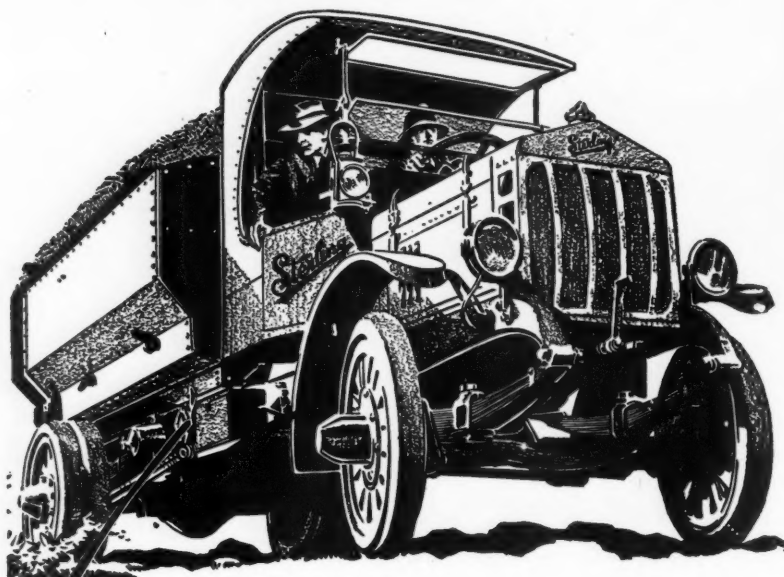
CUT OUT AND MAIL

ROCK PRODUCTS,
542 So. Dearborn St.,
Chicago:

Here's ONE DOLLAR for a special six
months' trial subscription.

Name

Address



Sterling
TRUCKS

Buy a Sterling on the Basis of An Investment

Merit is not a mark—it is a condition. It must be built in before it can be built upon.

The quality in Sterling goes all the way through—it is not just a mere matter of paint or appearance. We know that the things that you cannot see are more vital than those that you can. So we give the same care to the design and construction of all. That's why Sterling buyers don't quibble about the price when they buy more Sterlings.

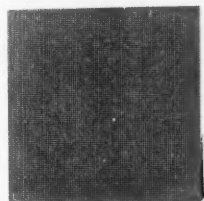
They know the power—service—dependability—reliability—and low operating cost—which were proved to a degree far in advance of our claims.

Over 11 years of exclusive truckbuilding are back of this statement.

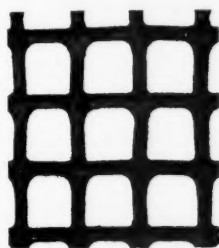
Sterling Motor Truck Co., Milwaukee, Wis.
Builders of Motor Trucks Exclusively for 11 Years

"TYLER"

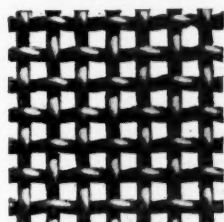
**DOUBLE CRIMPED WIRE CLOTH : TON-CAP SCREEN : TESTING SIEVES
TESTING SIEVE SHAKERS : INCLINED VIBRATING SEPARATORS**



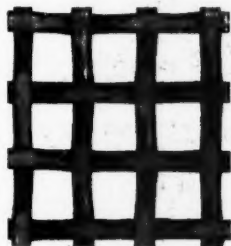
100 Mesh; .0045 Brass



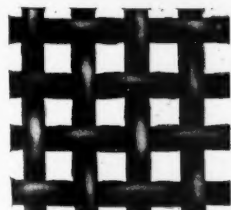
3 Mesh; .080 Galv.



6 Mesh; .080 Wire



3 Mesh; .105 Rolled



3 1/2 Mesh; .135 Wire

The above are "actual" size illustrations of "Tyler" Wire Cloth. Samples of any mesh and wire will be mailed on request.

Write for
Catalog No. 40

The demand of users from a field that is now world wide, is evidence of the economy of the Tyler Double Crimped Cloth in long life.

In the Tyler Cloth, the crown of the arches or crimps are of the same height both in warp and shoot, which is an element in the long life of double crimped wire cloth. The arch of one wire does not remain higher than another to receive more of the wear, as in single crimped cloth. Then, too, the double crimped feature of both warp and shoot renders both wires perfectly stationary and they cannot shift; thus the mesh remains intact until the screen is worn out, rendering an accurate product throughout its long life.

Tyler Double Crimped Wire Cloth is made in Iron, Steel, Brass, Phosphor Bronze, Aluminum, Copper, Monel Metal, Nickel, etc., and can be supplied in all meshes and sizes of wire.

To Get the Best Results

from a wire cloth screening surface, it is essential that the screen cloth be maintained in a smoothly stretched, taut condition.

Where a screen is loose and baggy, it is impossible to keep the material spread uniformly over its entire surface; the material collects in hollows, and effective sorting action cannot be obtained.

Screens at "Drumhead" Tension

In our WHIP-TAP Separator Screen illustrated below you have the ideal condition, as there is a direct, positive tension on every cross wire. The wire cloth has reinforced edges, which hold every wire firmly in place no matter how fine or coarse the mesh. A taut screening surface is at all times assured, for the tension is under the control of the operator. The operator stands at one side of the WHIP-TAP with one hand on the screening surface so that by the sense of touch, he can tell exactly when the proper tension is reached, and the tension can be increased or decreased by merely turning a key.

WHIP-TAP SEPARATOR for Screening

SILICA, AGRICULTURAL LIMESTONE,
SAND, GRAVEL, PHOSPHATE ROCK
AND OTHER ROCK PRODUCTS

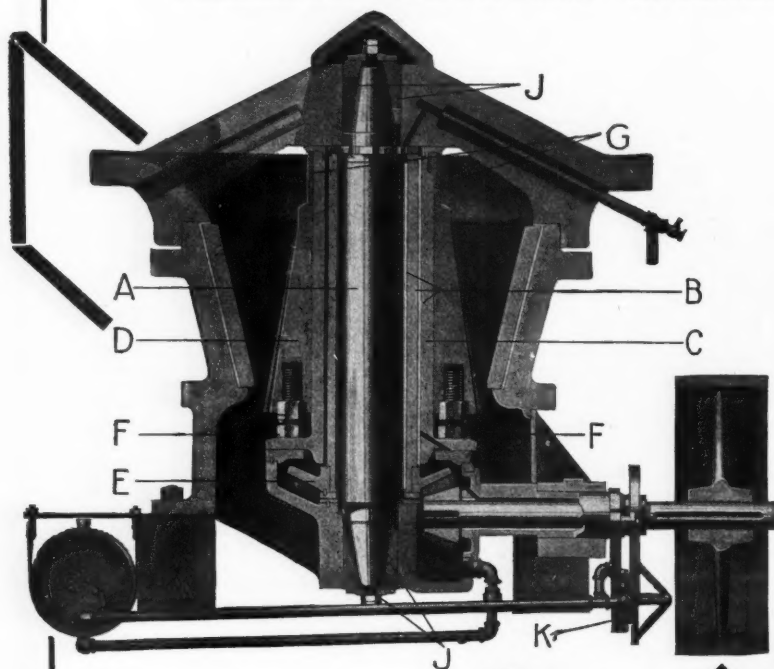
Write for full particulars



The W. S. Tyler Company
Cleveland, Ohio

For better service say, "I saw it in ROCK PRODUCTS."

A STRONG CRUSHING TEAM— TELSMITH PRIMARY BREAKER TELSMITH REDUCTION CRUSHER



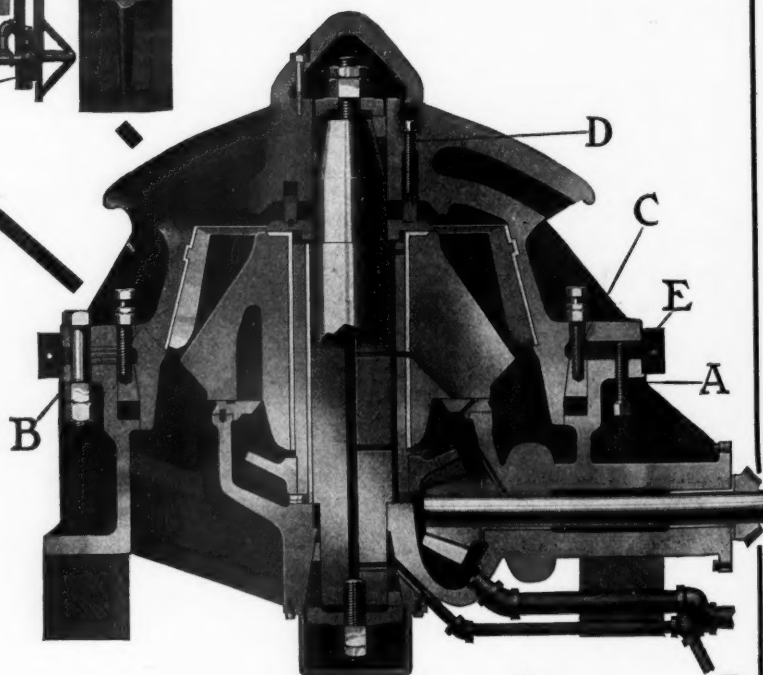
The Tel Smith Reduction Crusher is a "follow-up" crusher with the same pillar-shaft, the same low, stocky structure, the same huge crushing and bearing areas that distinguish the Tel Smith Primary Breaker—also these fundamental advantages:

(a) Open crushing hopper, allowing free, unassisted gravity feed. The Tel Smith Reduction Crusher can't be choked or over-fed, no matter how great the accumulation of stone over it.

(b) Free, gravity discharge from base of machine, with only very moderate wear on bottom spider and chute.

(c) A big reduction ratio. The No. 4 Reduction Crusher will take No. 7½, 8 or 9 crusher-run without screening and finish to ¾-in. size.

(d) Last (and most important), this crusher is free from complications, sturdy in build with very little fly-wheel effect. Tramp iron will seldom damage it. It's the kind of a machine that the experienced master mechanic enjoys running. Get Bulletin No. 2F11.



The Tel Smith Primary Breaker (upper picture) is the "lead-horse" of the team—the initial breaker. Can you find any other coarse crusher combining (a) short, heavy frame, (b) rigid bolt-shaft, (c) parallel crushing stroke with same length of "pinch" at top and bottom of bowl, (d) long sleeve eccentric and immense bearings, (e) huge crushing cone and concave bowl? The Tel Smith Breaker is used by Phelps-Dodge Corp. and American Smelting & Refining Co., both of New York; Defrain Sand Co., of Philadelphia; Charles Warner Co., of Wilmington, Del.; A. H. Wilcox Co., of Chicago; St. Joseph Lead Co., of Bonne Terre, Mo.; W. F. Woodruff, of Louisville, Ky.; Liberty Bell Gold Mining Co., of Telluride, Colo.; Casparis Stone Co., of Columbus, Ohio; Thomasville Stone & Lime Co., of Thomasville, Pa.; and hundreds of the best informed crusher operators in this country and abroad. Write for catalog No. 166.

SMITH ENGINEERING WORKS, 3188 LOCUST ST., MILWAUKEE, WISCONSIN

545 Old Colony Bldg., Chicago, Ill.; 30 Church St., New York City; 110 W. Park Way, N. S., Pittsburgh, Pa.; 930 Oliver Bldg., Boston, Mass.; 325 W. Main St., Louisville, Ky.; Garfield Bldg., Cleveland, Ohio; Franklin and Channing Aves., St. Louis, Mo.; 208 N. Third St., Columbus, O.

The advertiser wants to know that you saw his ad in ROCK PRODUCTS.

Atlas Explosives



Above: Face in quarry of Dixie Portland Cement Company, Richard City, Tenn., before the blast. **Below:** The effect of the blast, in which 52,000 pounds of Atlas Explosives were used, loaded in well holes. Atlas Service Men have assisted at many of the largest well-drill blasts ever fired.



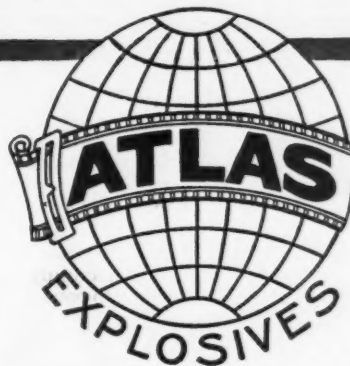
have reduced *blasting* costs and—by breaking the rock right—have reduced *handling* costs in every class of quarry work.

One reason why Atlas Powders are preferred by so many of the largest quarrymen, miners and contractors is that the explosives engineers of the Atlas Service Division take a personal and permanent interest in the way Atlas Powders are used. They co-operate with quarrymen to secure the proper balance between cost of explosives and cost of drilling and between blasting efficiency and rock loading efficiency. Frequently they are able to suggest changes in methods or in explosives that save their clients thousands of dollars.

Our Service Men will gladly co-operate with you. They will go anywhere to help in reducing blasting costs without obligation to you. Put your blasting problems up to us.

ATLAS POWDER CO. WILMINGTON, DEL.

Branch Offices: Allentown, Pa.; Birmingham, Ala.; Boston; Chicago; Des Moines, Ia.; Houghton, Mich.; Joplin, Mo.; Kansas City; Knoxville; McAlester, Okla.; Memphis; Nashville; New Orleans; New York; Philadelphia; Pittsburg, Kans.; Pittsburgh, Pa.; Pottsville, Pa.; St. Louis; Wilkes-Barre.



break the rock right

To say you saw the ad in ROCK PRODUCTS gives tone to your inquiry

Don't let your

THERE is big work to be done. New markets wait for those who can deliver the goods. Keep your factory wheels turning and your goods moving. The future belongs to those who act quickly. Pierce-Arrow trucks kept many a factory running bringing raw materials and carrying finished products to market without delays.



Pierce-Arrow trucks are available now to do their part. Our experience is at the

PIERCE- ARROW

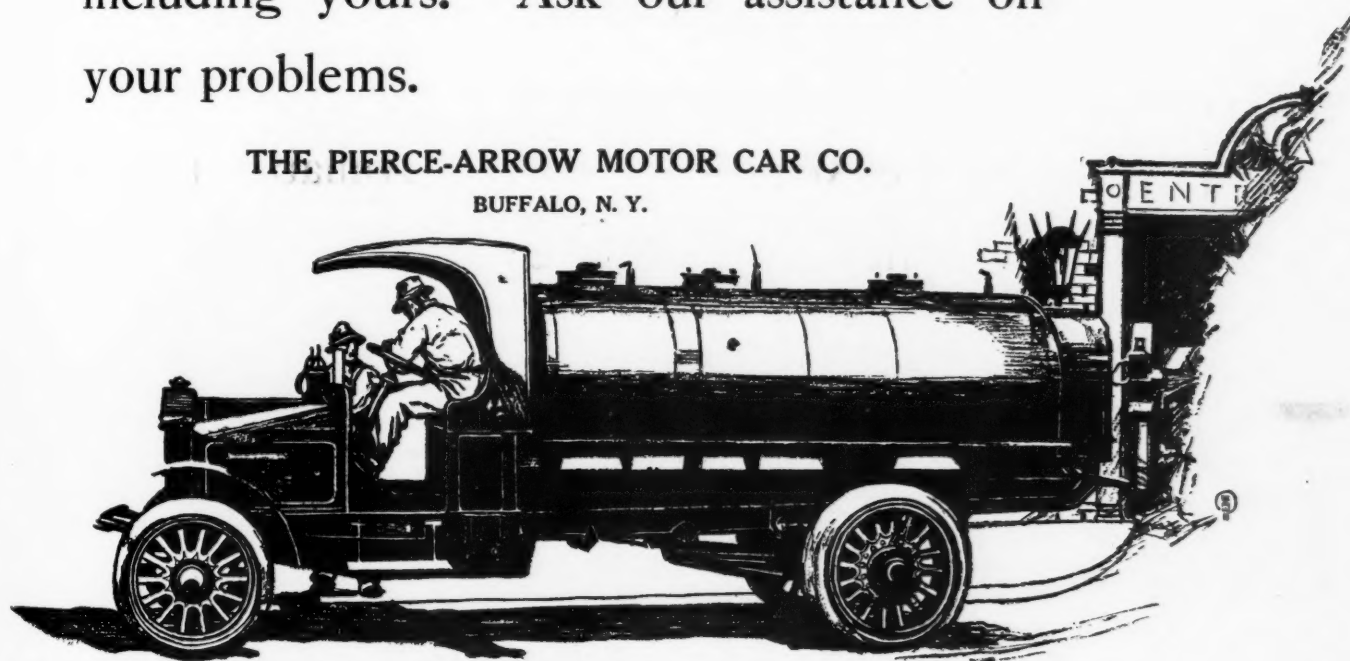
You will get entire satisfaction if you mention ROCK PRODUCTS

wheels slow up

disposal of those who need aid in expanding or redirecting their transportation facilities. We know what to do and how to do it cheaply and quickly.

We have met successfully all conditions of service in 148 different lines of business, including yours. Ask our assistance on your problems.

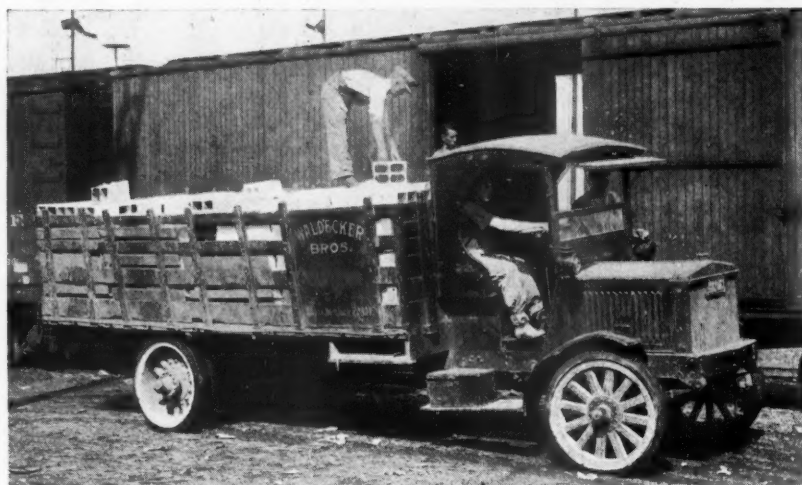
THE PIERCE-ARROW MOTOR CAR CO.
BUFFALO, N. Y.



**Delivers more work in a given time;
Loses less time on the job and off the job;
Costs less to operate and less to maintain;
Lasts longer, depreciates less and commands a higher resale price at all times.**

It gets immediate attention if you mention ROCK PRODUCTS

Another
FEDERAL



3 1/2 ton Federal which has made good for Waldecker Brothers of Detroit

Heavy Loads Emphasize Federal Quality!

It doesn't matter where you see a Federal working, you will nearly always see it carrying a full load. In the building business it is giving splendid service to hundreds of owners in hauling bricks, concrete, stone, etc., etc.

Federal's great stamina make it peculiarly fitted for this type of work. It stays on the job—day after day—month after month—always working efficiently and economically.

Write us and we will send you the monthly magazine, "Traffic News"—a publication for the truck owner and buyer.

FEDERAL MOTOR TRUCK CO.
43 FEDERAL STREET, DETROIT, MICH.

FEDERAL

One to Five Ton Capacities

"Return loads will cut your haulage costs"

Saying, "I saw it in ROCK PRODUCTS," will bring quick action



Aboard the Yankee Destroyers

—down in the very heart of their machinery, you'll find a name known throughout the American Navy—Blake & Knowles, of Worthington.

And you may find this name not once or twice, but on certain types of destroyers as many as 26 times—on 26 separate pumps, faithfully performing their prosaic but vitally important duties.

Just see the diversity of the list:

Main Air Pumps	Fresh Water Pumps
Auxiliary Air Pump	Lubricating Oil Pumps
Main Boiler Feed Pumps	Oil Cooler Circulating Pumps
Auxiliary Boiler Feed Pumps	Fuel Oil Service Pumps
Fire and Bilge Pumps	Fuel Oil Booster Pumps
Evaporator Feed Pump	

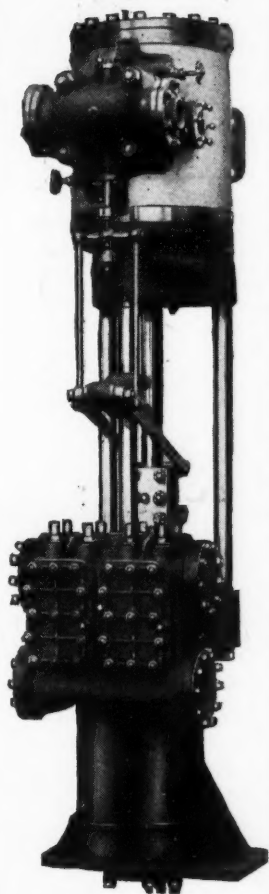
All made by Worthington, at our Blake & Knowles Works, which for 50 years has served both our Navy and our merchant shipping.

It was Worthington organization and experience, plus a large expansion in our East Cambridge shops, which made possible some remarkable delivery records—not merely on the thousands of pumps we made for the 150-destroyer program, but also on equipment for many other war-craft. And it is this same organization, enriched by this war experience, that bids fair to play a major part in the upbuilding of our merchant marine.

Worthington Pump and Machinery Corporation

Executive Offices: 115 Broadway, New York City

Branch Offices in 24 Large Cities



PRODUCTS FOR MILL AND QUARRY:

Air Compressors	Screens
Gyratory and Jaw Crushers	Ball Mills
Cement Making Machinery	

Special Bulletins on Request

PUMPS—COMPRESSORS—CONDENSERS—METERS—OIL & GAS ENGINES—MINING MACHINERY

WORTHINGTON

Worthington Works, Harrison, N.J.
Blake & Knowles Works, East Cambridge, Mass.
Deane Works, Holyoke, Mass.
Hazleton Works, Hazleton, Pa.

Snow-Holly Works, Buffalo, N.Y.
Laidlaw Works, Cincinnati, Ohio.
Power & Mining Works, Cudahy, Wis.
Gas Engine Works, Cudahy, Wis.

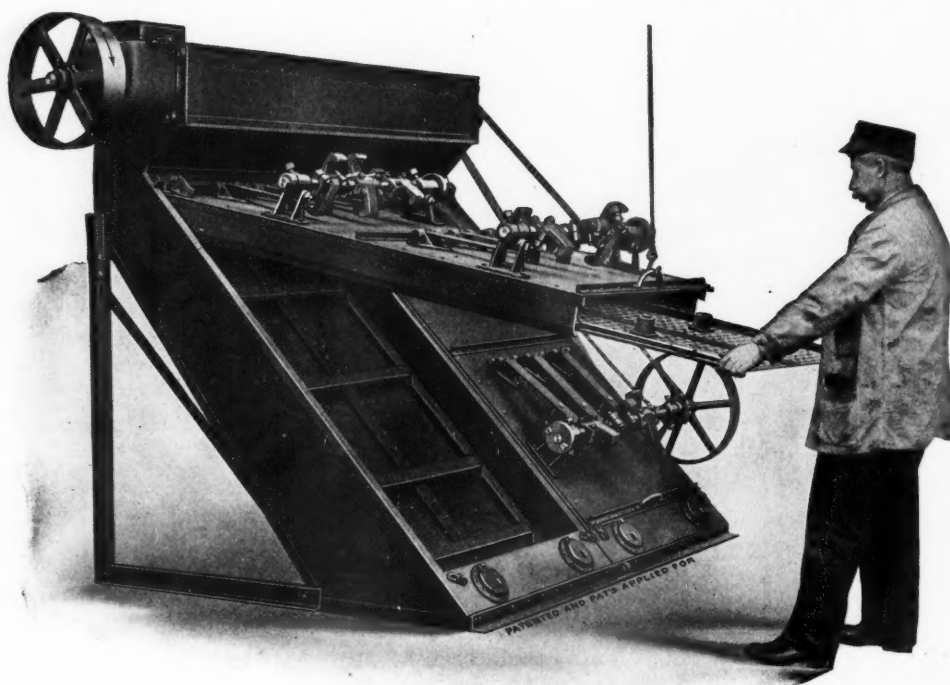


"ONE MAN - ONE MINUTE"



STURTEVANT "OPEN-DOOR" MACHINERY

"Open Door" Sturtevant Super-Screen



The Super-Screen not only screens everything screenable with a range of 4 to 160 mesh, giving from one to four products from one machine, but is of Sectional, or Unit, "Open Door" construction with all parts interchangeable and of such small size that one man can handle them easily and quickly. Add sufficient number of Units to secure output wanted.

You see one man opens the door, removes the screen frames, both scalper and fine screens, and tightens the cloth—all through the open door. A one man proposition throughout—no time or labor wasted. Keep the screen in perfect condition for maximum output.

Open Door Super-Screens, like all other Sturtevant "Open Door" Machines, are built for service, to give maximum profit, to do your work cheaper than any other Screen, and they last.

Send for Catalog of Open Door Designs of Crushing, Grinding, Screening, Elevating, Conveying, Weighing and Mixing Machinery.

STURTEVANT MILL CO., BOSTON MASS.
HARRISON SQUARE

Prompt attention will be given your inquiry if you mention ROCK PRODUCTS



"ONE MAN - ONE MINUTE"



STURTEVANT "OPEN-DOOR" MACHINERY

"Open-Door" One Man-One Minute Plant

COMPLETE CRUSHING, GRINDING, ELEVATING AND SCREENING PLANTS, FOR HARD OR SOFT MATERIALS.

MACHINES OF STURTEVANT "OPEN-DOOR" CONSTRUCTION.

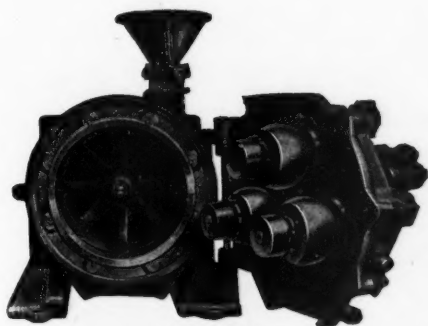
EVERY PART ALMOST INSTANTLY ACCESSIBLE, SO THAT ONE MAN CAN SWING THE EASILY OPENED DOORS AND REACH EVERY PART, FOR INSPECTION, CLEANING OR REPLACEMENT.



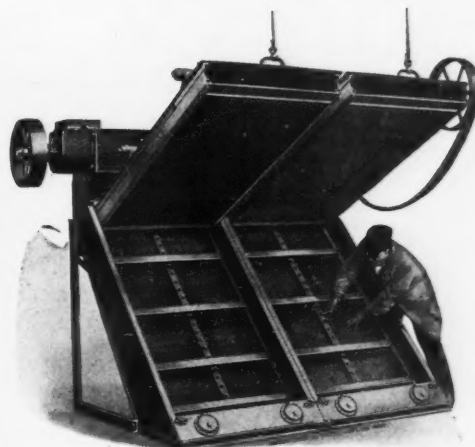
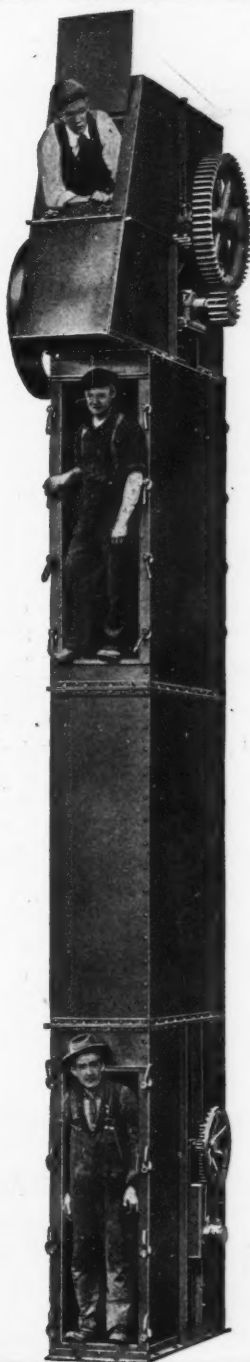
Labor Saving—Owing to the Open Doors one man can do the work of many men in much less time.

Minutes replace hours of valuable time (overtime and Sundays).

Continuous Operation — Production depends upon the amount of time plant is in operation and the condition of the machinery. Quick access means quick repairs and minimum time lost in shut downs.



PATENTED



Ease of getting into machine for adjustment, replacement and inspection without long stops allows you to keep machines in perfect condition, and at maximum production.

Shut downs are costly, non-productive labor and loss of output soon devour profits. Inaccessible machinery has no place in a modern plant.



PURCHASE ALL OF YOUR CRUSHING, GRINDING, SCREENING, CONVEYING, WEIGHING AND MIXING MACHINERY, INCLUDING SPOUTS, CHUTES, HOPPERS, ETC., FROM ONE CONCERN.

WE ARE EXPERTS IN MODERN DESIGNS, AND SPECIALISTS IN THIS TYPE OF MACHINERY.

SEND FOR CIRCULAR

STURTEVANT MILL CO., BOSTON MASS.

HARRISON SQUARE

You will get entire satisfaction if you mention ROCK PRODUCTS.

The Demand of the Times: RESULTS! PROVEN EFFICIENCY!

Because a vast amount of construction work held up for years by the Big War has suddenly been released upon the engineering and contracting field, the imperative necessity is for thorough efficiency and thorough reliability in all equipment---for A No. 1, twenty-four-hour-a-day Results!

The Symons Disc Crusher Stands Upon a Long-Established Record of Achievement

Road work, new and repair, in every state in the Union, will create a far-reaching demand for such equipment. Railway, public and private building and construction, and new projects running into millions of dollars, will be let out. The volume of this work requires concentrated efficiency, to meet and handle it successfully.

The Symons Disc Crusher is not only highly successful in its own field—which was originally secondary crushing—but it is also doing excellent work as an initial breaker for hard-heads and gravel.

The Symons makes play of its work. It should have a place in every modern plant. Remember—its upkeep is scarcely "in sight," and its dependability is supreme.

Write for full illustrated literature

Chalmers & Williams
1425 Arnold Street Chicago Heights, Ill.

Record of a 48-inch Crusher in the field

Material crushed, Limestone.

Length of time operated, 3 years.

Size of feed, 4".

Size of product, 1½".

Horsepower used, 65.

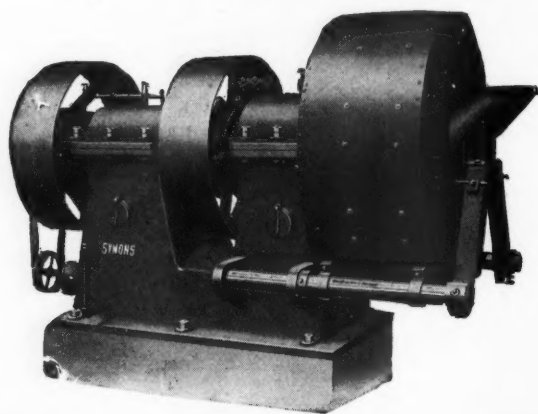
Tons per hour, 80 to 100.

Tons crushed per set of discs, 750,000.

A 6" feed can be handled just as effectively.

No lost time on account of breakage.

We also build them in 18" and 36" size.



Record of a 24-inch Crusher in the field

Material crushed, Gravel and Hard Heads.

Length of time operated, 2 years.

Size of feed, 2".

Size of product, ½".

Horsepower used, 20.

Tons crushed per hour, 25.

Original crushing discs still in use.

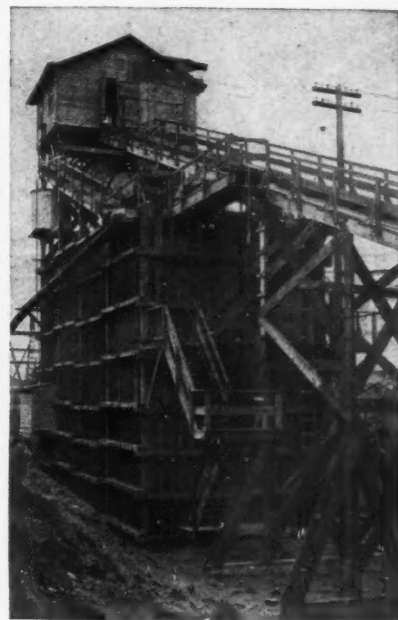
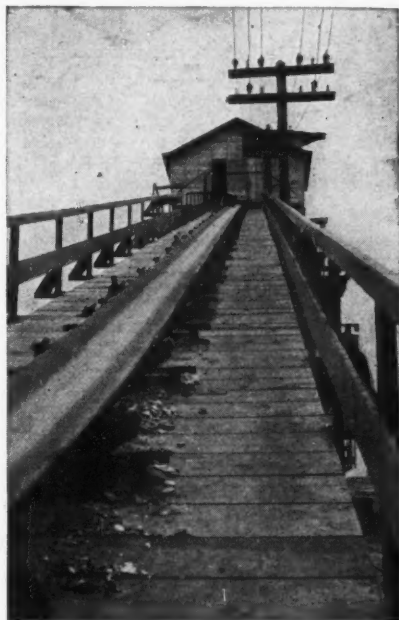
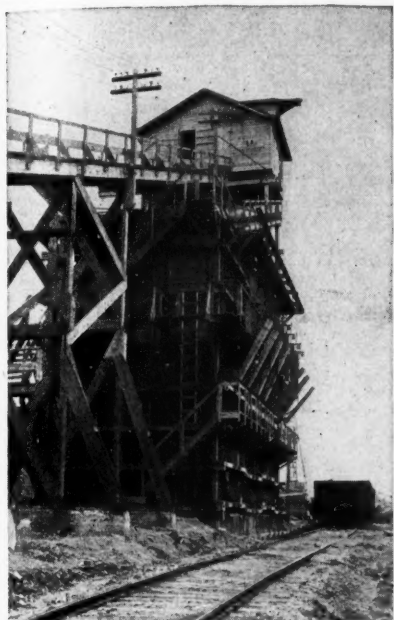
No lost time account breakage.

Superior to Rolls, Jaw or Gyratory Crushers on this class of work.

SYMONS

DISC CRUSHER

To say you saw the ad in ROCK PRODUCTS gives tone to your inquiry



Why Buy Experiments?

Our engineers have designed three out of every four sand and gravel washing plants in the United States.

Not one of them was a "cut and dried" proposition. Each was designed to meet individual requirements. Whether the desired output was 10 or 300 carloads a day, local conditions formed the basis of our engineering calculations in each case.

No Link-Belt designed and

equipped sand and gravel washing plant is an experiment. The success of your plant is assured the moment you avail yourself of our services in its design.

We have an attractive book showing what we have done for others and telling what we can do for you. Send for a copy.

LINK-BELT COMPANY

PHILADELPHIA

New York.....299 Broadway
Boston.....49 Federal St.
Pittsburgh.....1501 Park Bldg.
St. Louis.....Central Nat'l Bank Bldg.
Buffalo.....547 Ellicott Square
Wilkes-Barre.....Second Nat'l Bank Bldg.

CHICAGO

BRANCH OFFICES

Cleveland.....429 Rockefeller Bldg.
Detroit.....732 Dime Bank Bldg.
Kansas City, Mo.....306 Elmhurst Bldg.
Seattle.....576 First Avenue, S.
Portland, Ore.....First and Stark Sts.

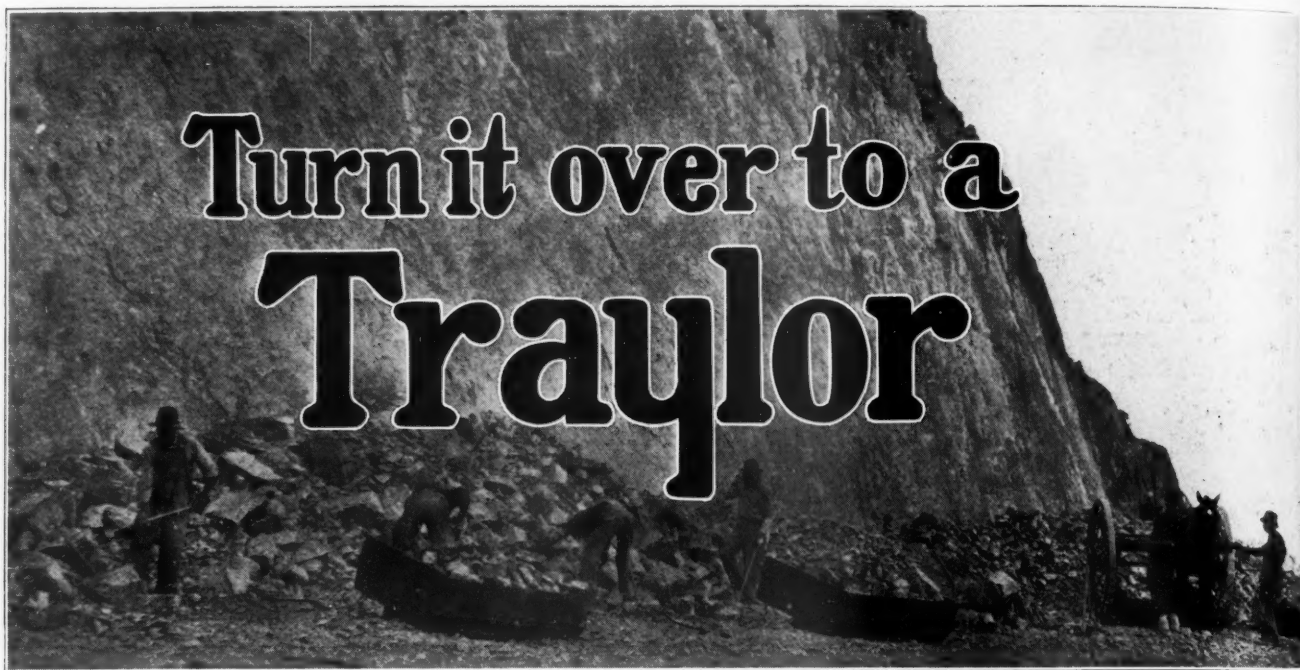
INDIANAPOLIS

San Francisco.....582 Market St.
Los Angeles.....163 N. Los Angeles St.
Toronto, Can.....Canadian Link-Belt Co., Ltd.
Denver.....Lindrooth, Shubart & Co. Boston Bldg.
Louisville, Ky.....Frederick Wehle, Starks Bldg.
New Orleans.....C. O. Hinz, Hibernia Bk. Bldg.

LINK-BELT

Sand and Gravel Washing Plants

It gets immediate attention if you mention ROCK PRODUCTS.



Turn it over to a Traylor

Traylor "Bull Dog" Gyratory Crusher

JUST let a Traylor "Bull Dog" clamp its jaws on a bunch of "hard-heads" or trap-rock. Crunch, crunch, crunch—and it is all over. Handles the hardest stone as though it were chalk.

Why? Because the eccentric is both longer and of greater diameter than any other. Its force is irresistible.

But there are other features. For one thing, the shaft is much shorter and one hundred per cent stronger than standard gyratory shafts.

Ever experienced trouble in lubricating? Not if you've used Traylor. They have the positive force-feed lubrication system.

And the entire construction tends to reduce up-keep to a minimum—increase production to a maximum—and to go easy on power.



*We make all kinds of Crushers.
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CHICAGO

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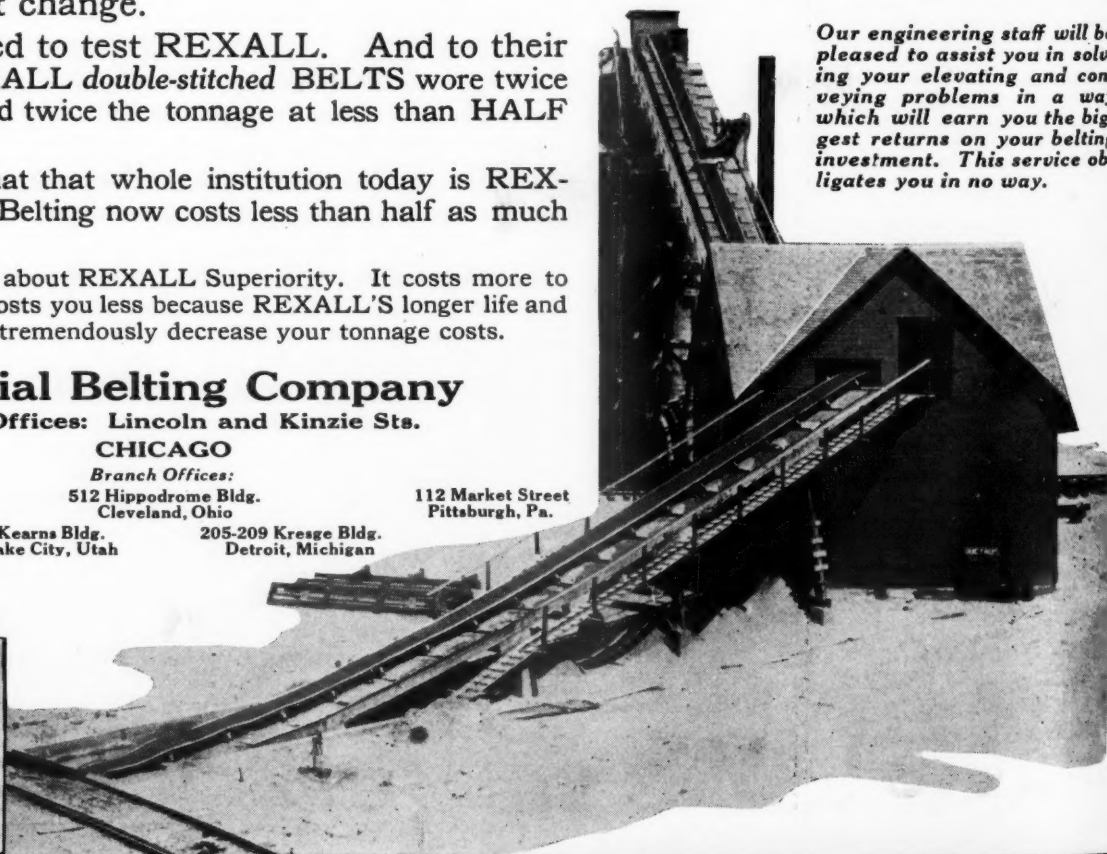
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**WEARS
OUT
BUT
NEVER
GIVES
OUT**



Rock Products

Vol. XXII

Chicago, April 12, 1919

No. 8

Time For Organized Efforts to Get Railways Properly Ballasted

Public Travels in Constant Danger Because of Present "Pass-the-Buck" Policy

IF THERE IS ANY ONE THING that the Government was bound to do when it assumed the operation of the railways, it was to spare no effort and no expense to insure the greatest possible safety to the traveling public. Increased wages, increased passenger and increased freight rates are only justified on that ground.

It is immaterial whether Congress is responsible, or whether the Railroad Administration, or the railway operating officials themselves are the ones to blame, the fact remains that *Government operation* as an institution is responsible for a most deplorable situation in which the railway track departments find themselves today.

It is common knowledge among railway-track men that railway roadbeds have been insufficiently and inefficiently maintained ever since the Government assumed charge of operation. Even before that time the poverty-stricken condition of many of the railways prevented absolutely necessary improvements and often even the most necessary maintenance work.

For instance, during the calendar year 1917 there were 2,072 accidents directly traced by Interstate Commerce Commission investigators to defective track and track appurtenances. These 2,072 accidents caused the deaths of 36 persons and injuries to over 1,700 others. Property damage to the extent of \$2,000,000 was done through these defective-track accidents. Taking the value of a human life at \$5,000, the ordinary legal figure, and the damages from the injuries at \$1,000 per person, which is very conservative, and we have an annual loss due to defective track of about \$4,000,000.

Last year under stress of war conditions and an unprecedented labor shortage the Government appropriated nearly \$10,000,000 for ballasting the tracks of the Federally operated railways. This amount consisted of very carefully pruned estimates and represented *only work considered absolutely essential* to "safety-first" maintenance. Yet of that fund only \$4,400,-

000 was actually expended. The reasons were that the working season was more than half over before the wages of track laborers were adjusted to a scale where any workers could be had; and when labor could be had the appropriation, which was a part of the \$500,000,000 "revolving fund," had revolved out of existence to pay for other things.

Certainly after another year's depreciation without even *safety-first* maintenance one would expect the railways to be in greater need of ballast than ever before. Yet the appropriation for ballasting this year was fixed at only \$6,000,000. However, added to the unexpended appropriation of 1918 the total in sight for this very essential work was \$11,500,000. Then Congress failed to provide for financing the \$750,000,000 railway improvement program, of which the ballasting was doubtless looked upon as the most insignificant item, and today the railways are without much needed funds for track work and are reported to be cancelling tentative ballast orders right and left.

The Interstate Commerce Commission apparently has discreetly refrained from publishing accident statistics since the Government has taken over the railways, but newspaper reports and other information lead us to believe that no great showing if any has been made over the accident records of the privately-owned railways of other days. We have been told that the chief engineer of a great railway system said recently in conversation that it is only a question of days, maybe hours, before one of its limited trains is derailed and wrecked by a defective track. Freight trains go off the rails of this road every day.

As far back as 1917 the records show that serious derailments caused, absolutely beyond question by rotten track, occurred on the Baltimore & Ohio, the Wabash, the Pere Marquette, the Minneapolis & St. Louis and the Southern Pacific, which proves beyond a doubt that the conditions are country-wide and not confined to railways formerly notorious for poor track. Indeed,

398 of the 2,000 derailments in 1917 were due to "soft track"—in plain words a want of adequate ballast. Some 1,250 of the other derailments were caused by "broken rails" or "spreading rails," both of which, in a large measure at least, are attributable to poorly or insufficiently ballasted track.

As public-spirited citizens, as men who do some traveling themselves, every mineral aggregate producer can and ought to take an active part in rectifying these conditions. That he furnishes the ballast to make the roads safe is no reason why his voice should not be raised against a national crime. Railway track officials are now fond of assuming an attitude of indif-

ference, passing the buck to the Railroad Administration, which can pass it on the Congress, which can pass it back again and thus keep up the merry-go-round until a terrible accident arouses public interest and gives weight to public opinion.

It would be a very pertinent thing for mineral aggregate producers, both individually and collectively, through their national and state associations, to call attention of the public and of their congressmen to the hazards the railways are taking by failure to properly maintain and reconstruct their track roadbeds, to the safety of which hundreds of thousands of innocent people daily trust their lives and limbs.

And Recently the Railroad Administration Appropriated the Sum of \$1,000,000 to Encourage Tourist Travel!

Order Your New Machinery Now to Avoid Delays in Deliveries

INFORMATION GIVEN ROCK PRODUCTS by the most authoritative sources shows beyond question that this country is on the verge of a period of great construction activity. Machinery manufacturers are unanimous in stating that never before have they had so many inquiries for equipment and never was there so much business *in prospect*. Just at the moment, most of the operators in the rock products industries are in the same class with all other business men—a little shy, and still hoping for lower prices. As the sales manager of a great machinery corporation puts it, "There is an awful lot of business being dammed up all over the country, and when the dam breaks, we will all be flooded."

Of course no one can prophesy with any accuracy when the break will come, but we see many signs of the dam weakening every day. According to the latest news as ROCK PRODUCTS goes to press, the peace treaty will be ready for signature in a very short time. The relief in getting this over with will affect every single one of us, in his mental attitude at least. With the peace treaty out of the way, there is reason to believe an early settlement of the problem of Bolshevism will follow.

This country is now floating what is likely to be our last big war loan,

Says Secretary Sandles of the National Crushed Stone Association to Secretary of Labor Wilson

"**SOME INDUSTRIES** are patriotic and will lower prices. They should. Some men who want to be patriotic now filled their pot and pocketbook out of unprecedented war prosperity. Road building was hit and hurt. Men who manufacture road material were punished. Some compelled to suspend operation. Stone men are now asked to reduce prices so as to get in good society with those who made millions out of the war. Official Washington should have a more practical viewpoint on this matter."

Keep Up the Fight For Lower Freight Rates

THE ATTITUDE of the Railroad Administration toward reducing freight rates made **DURING THE WAR TO DISCOURAGE CONSTRUCTION** is unsatisfactory to say the least—not to rock product producers only but to **EVERYBODY**. E. Guy Sutton, Secretary of the National Association of Sand and Gravel Producers, is in Washington fighting the battle for mineral aggregate producers. Give him your moral and your material support!

and as soon as it is out of the way the financial decks will be clear for action on a hundred thousand and one construction projects. The tangle of the Railroad Administration on freight rates on building materials and its attitude toward accepting the prices fixed by the Industrial Board are indeed the only really vital things which need immediate action. At the meeting of the new Congress in another month, it is to be hoped a quick solution will be effected. With the gathering storm of public opinion, it can not be long delayed.

Therefore, we are inclined to accept the opinion of the machinery manufacturer who writes: "We are looking for the break within the *next sixty days*, and when the flood comes everybody will want their equipment at once and will howl for early deliveries. The most optimistic estimate which we have encountered in regard to a reduction of prices is that the recent cut in iron and steel prices will not reduce machinery prices more than 6 to 8 per cent. That reduction is already in effect, and it would seem to us good business on the part of the buyers to anticipate the flood so that they will not get in at a time when everybody is clamoring for their machinery and when deliveries are slow."



Remarkable New England Gravel Deposit

With a Waterfront Plant in Shipping Distance of the Boston Metropolitan District—
5,000 Cu. Yds. Per Day—Shaker Screens Used Entirely

THE BOSTON SAND & GRAVEL Co., Boston, Mass., has probably one of the finest sand and gravel propositions in the entire country. This is a small mountain of excellent gravel (estimated to contain 50,000,000 cu. yds.) accessible by water and 25 miles by water from the city of Boston. The deposit runs about 50-50 sand and gravel and is contained in a long ridge or bank admirably adapted to steam-shovel operation. Practically no stripping is required. The location of the bank called Coleman Heights, is in the town of Scituate on a famous part of the Massachusetts coast.

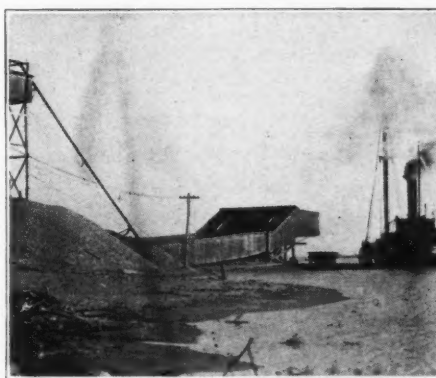
The property was acquired by the Boston Sand & Gravel Co., in 1914; and one of the most interesting plants in the country was constructed to develop the property. It is probably the largest gravel plant in the country where all the screening is done in shaker screens. Also, the plant has no bin storage, all the material being piled on the ground and recovered by means of underground concrete tunnels and belt conveyors.

Steam-Shovel Operated Pit

Until a year or two ago the pit was operated by a drag line. The screening and washing plant is located near the water front, while the deposit lies about 1,500 ft. back. Originally the excavation and transportation of the material to the plant was by means of a 3-cu. yd. scraper

bucket operated from a movable tower on the bank and a balanced skip railway incline.

The drag line brought the material to a concrete hopper where it was dumped to the skip cars below. The operation outgrew the drag line and now the material is excavated by steam shovels and is brought to the foot of the incline in standard-gauge railway dump cars, as is



Wharf end of plant

shown in the view at the head of this article.

Plant Equipment

The cars operating on the incline are steel throughout and are of 10 cu. yd. capacity each. The top of the incline is 110 ft. above ground level. The cars dump into a hopper and by a hand-

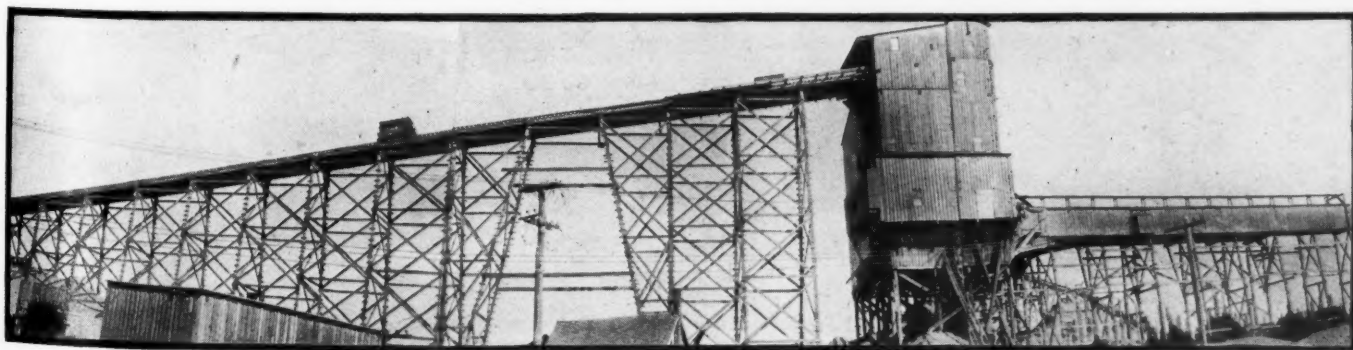
operated gate the material is fed from this hopper to an inclined grizzly, the finer material dropping through upon a battery of shaker screens, while the grizzly itself serves as a chute to an adjacent jaw crusher near the top of the plant. The crusher discharges by gravity to the shaker screens below.

The screens are four in number, one above the other; each screen has all perforations of one size. All four take not more than 10 ft. of head room. These screens are 6 ft. wide by 25 ft. long and are shaken at the rate of 60 oscillations per minute by crank-arms from pulley-driven eccentrics. The screens are hung from above on rocker arms 16 ft. long made of 2x6 in. plank, fastened edgewise to the screen frames.

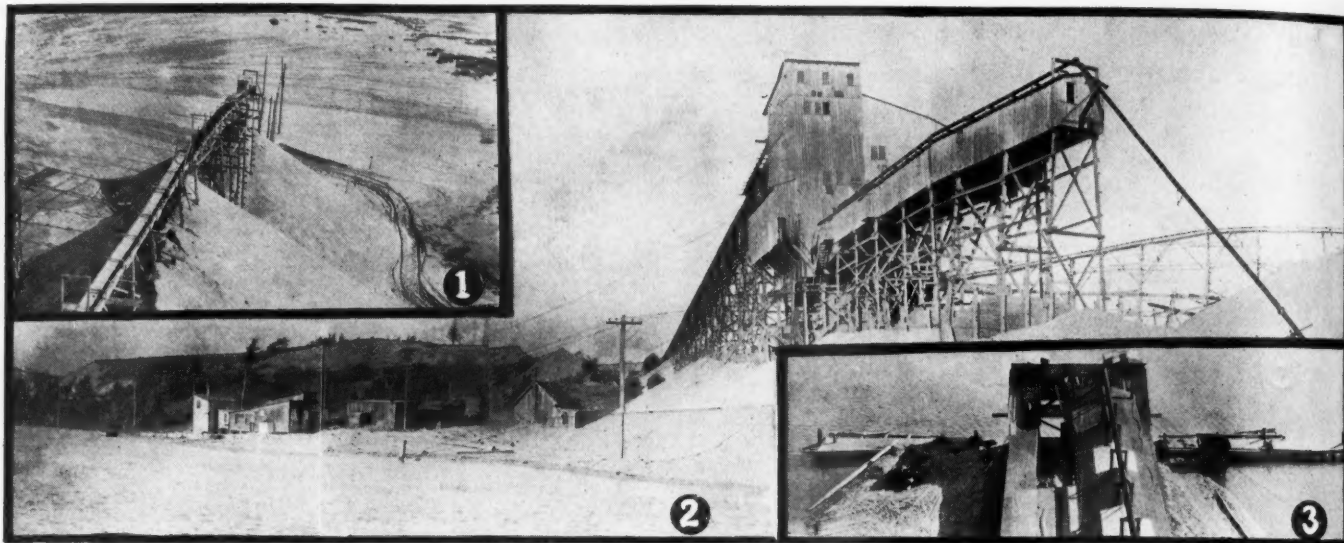
The screens are operated in pairs, the two above oscillating opposite to the two below. Water is fed to the screens at the rate of 2,200 gal. per minute. Rejections from the coarse screen are elevated to a special double-jaw crusher near the initial crusher, and the output of this tailings crusher goes back to the screens by gravity.

Special Sand Washing Box

The different sizes of gravel go by chutes to belt-conveyors and then to the storage piles. The fine sand falls through all the screens to a 10x20x6 ft. deep settling tank, made of wood, below the shaker screens. This tank is



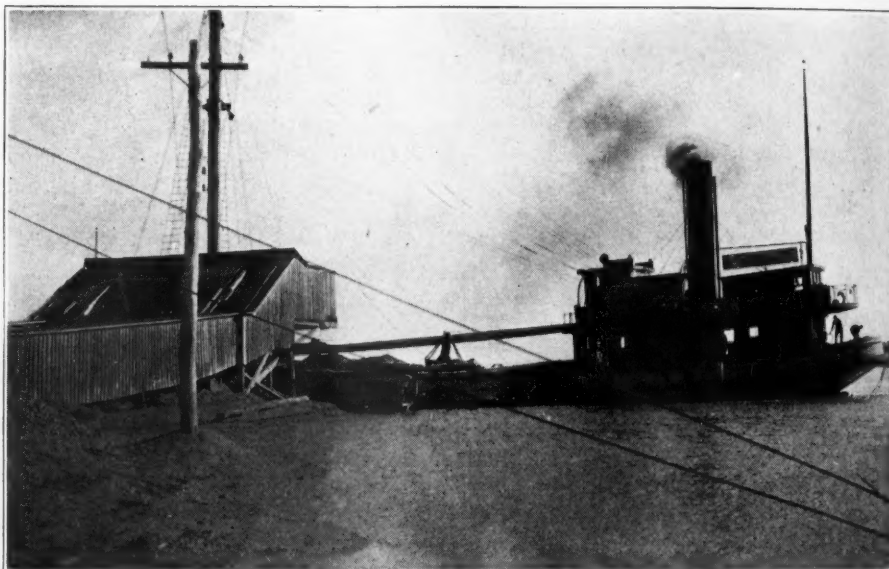
Plant of the Boston Sand & Gravel Co. at Scituate, Mass., 25 miles from Boston



(1) Wash water flume and silt wasted. (2) Plant from the water front. (3) Loading wharf, showing ends of conveyor tunnels

equipped with a flight conveyor, which drags the material through the flowing water and discharges it over the end of the tank. The silt and dirty wash water overflow from the lower end of the tank and are piped away.

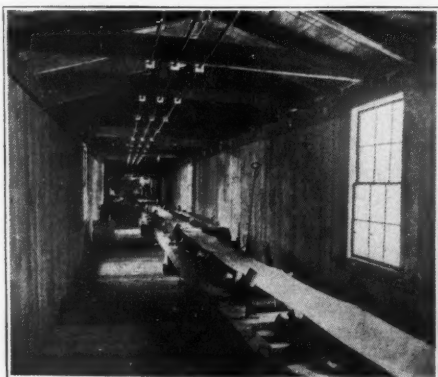
The whole operation is very compact and efficient and produces a remarkably clean product. The whole plant is operated entirely by electricity, about 400 h. p. being required. This power comes over a 15-mile, 13,000-volt transmission line and is delivered to the motors in



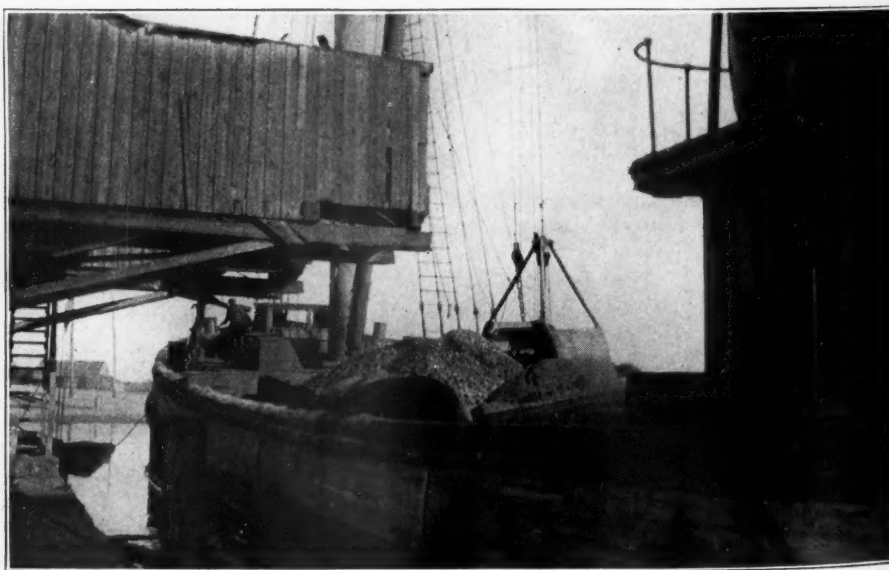
Steam lighter taking on cargo of sand and gravel



Drag-line excavator formerly used



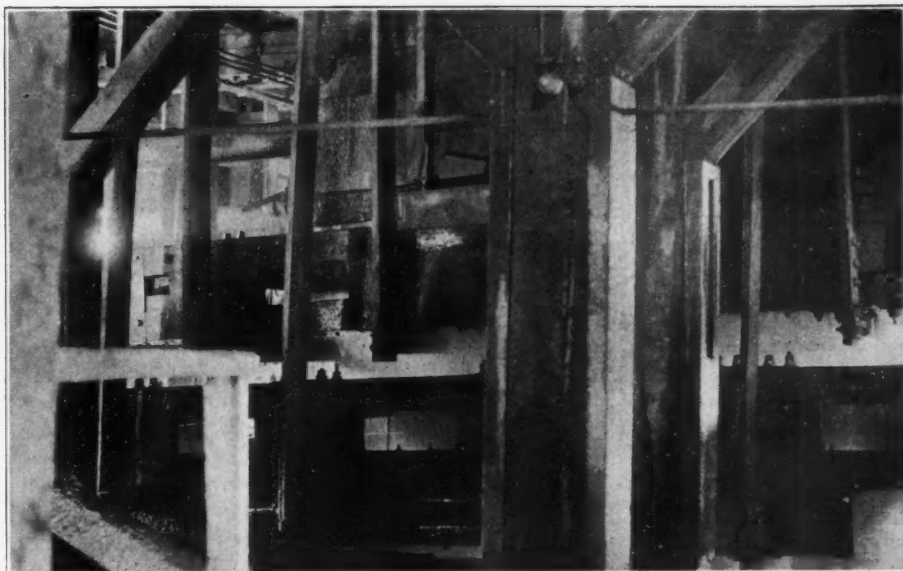
Conveyor gallery over storage piles



Near view of lighter, showing unloading bucket



Above—Combined grizzly and chute to crusher. Above to right—Shaker screens and their rocker arms. To right—Special sand box with flight conveyor.



the form of a 550-volt, 3-phase, 60-cycle current. It was one of the very earliest eastern gravel plants to be electrically equipped. Only ten men operate it.

Storage for approximately 25,000 tons of finished material is provided by means of belt conveyors which discharge upon the ground into a long pyramidal pile. Under this pile are two parallel concrete tunnels 8-ft. square, each containing a 30-in. conveyor belt. The sand and gravel are drawn off through hopper openings in these tunnels upon the belt conveyors, which discharge through a housing at the end of a wharf at the rate of 1,000 tons per hour.

Transportation Department

The company owns a fleet of steam lighters like the one shown in the accompanying views. To get these vessels to the plant wharf it was necessary to dredge a channel to deep water, a distance of about a mile and a half. The present channel opening itself, moreover, known as the North River, did not exist until the great storm of 1898, which tore a hole through the cliffs and made the new mouth of the river. (This was the storm in which the steamer "Portland" bound from Boston to Portland, Me., was lost with all on board—a memorable event in New England).

The lighters carry from 450 to 1,000 tons, each and one can be loaded in from 20 to 45 minutes, depending of

course upon the size of the boat. Each lighter is provided with a mast and boom and grab bucket or clam-shell and can place its cargo anywhere on the waterfront of Metropolitan Boston.

The company also uses these lighters to dredge and transport sand from Plum Island and other coarse and fine beach sands into Boston and vicinity. These sands are used extensively for plastering, sand blast and core work.

The plant operates practically the year around and has turned out well towards 1,200,000 cu. yds. in a single season. Besides the tremendous market of Boston and vicinity, this plant ships to all points along the New England coast. The Boston Sand & Gravel Co. also does wrecking, freighting, dredging, wharfing, and has divers for marine work.

The president of the company is Paul P. Bird, of the firm of Morton, Bird & Whitman, of Boston, Baltimore and Chicago, and the treasurer and manager is E. LeRoy Lane, who is one of the Con-

necticut Lane brothers, prominent building contractors and quarry operators for many years. Mr. Lane was the Boston District chairman of the War Service Committee on Mineral Aggregates.

Standard Sand for Tests of Lime and Gypsum

WASHINGTON, D. C.—The testing strength of cement lime mortars has been completed by the Bureau of Standards. Sixty-six different varieties were tested. A report on the results will be issued in the near future.

Investigation is now being made of the effect of various grades of sand on the properties of lime mortar and plaster. A program for this work has been planned and equipment and material are now being collected. It is believed that information secured will enable the bureau to write specifications for standard sand for laboratory tests of lime and gypsum.

Digging Out Costs in Production of Gravel

Monthly Uniform Statement of Illinois Association Points the Way to Members

GETTING DOWN to the fundamentals of costs was one of the very first things that the Illinois Sand & Gravel Producers' Association planned when it decided on a paid business director and employed Ben Stone.

The plan is for each member concern to send Mr. Stone a monthly cost statement as shown herewith. From the figures supplied, Mr. Stone will prepare a general comparative report showing itemized costs at each plant, the identity of no plant being disclosed either by name nor location.

A study of this headquarters report will enable each member to ascertain wherein it is extravagant in its administrative, sales or operating departments and will guide it to a policy of investigation and reform at those points where excesses in costs occur.

Will Not Change Bookkeeping

"The compilation of cost statements on this form will not necessarily change the bookkeeping methods of any member," said Mr. Stone to a ROCK PRODUCTS representative. "This form has been arranged for the purpose of furnishing the business director with information in a uniform manner that he may be able to make a correct and complete cost statement in detail."

An explanation of the charges to be made under the various heads shown in the cost statement has been sent to each member. Depletion and depreciation require extended explanation. The Income Tax law as amended lays out the course the government requires in figuring depletion.

Suggestion on Depreciation

Depreciation has a more variable nature. Ben Stone has written regarding depreciation as follows:

"Discussion of depreciation has developed that each company represented at the March 6th meeting followed a definite plan, some figuring five per cent of the original cost each year and some taking ten per cent each year, while one, at least, had spread out over a long period by taking ten per cent of the original cost the first year and then taking ten per cent of the balance in each subsequent year.

We realize that depreciation, like many other items of cost, will vary according to methods used; but we do not believe the life of any sand and gravel plant should be figured longer than ten years, and while we realize this is an item which must be governed by individual

conditions, we suggest that depreciation be figured, wherever practicable, with respect of the approximate life of each class of equipment in the plant. It was the unanimous opinion that depreciation of office equipment might safely be charged out at an annual rate of ten per cent of the original cost."

EXPLANATION OF THE CHARGES TO BE MADE IN COST STATEMENT

Administration

1. Association dues—all association dues—both state and national.
2. General Expense—To include travelling expenses of officers and managers

ILLINOIS SAND AND GRAVEL PRODUCERS ASSOCIATION						
UNIFORM COST STATEMENT						
Firm _____			Plant. _____		1919.	
Tons produced, all grades _____			Days worked _____			
			PRESENT MONTH		TOTALS TO DATE	
	Items	Totals	Unit	Items	Totals	Unit
ADMINISTRATION						
1. Association dues						
2. General Expense						
3. Interest						
1. _____						
2. _____						
3. _____						
4. _____						
4. Salaries						
1. _____						
2. _____						
3. _____						
5. Taxes						
1. Corporation						
2. Income						
3. Personal						
4. Real Estate						
OFFICE EXPENSE						
1. Depreciation—office fixtures						
2. Salaries						
3. Rent						
4. Travelling Expense						
5. Telephone & Telegraph						
6. Supplies						
7. Miscellaneous						
SALES EXPENSE						
1. Advertising						
2. Telephone & Telegraph						
3. Travelling Expense						
4. Salaries						
5. Miscellaneous						
OPERATING EXPENSE						
A. Administrative						
1. Depletion or Royalty						
2. Depreciation						
3. Demurrage						
4. Insurance						
5. Obsolescence						
6. Switching						
B. Direct Operating						
1. Fuel						
2. Labor						
1. _____						
2. _____						
3. _____						
4. _____						
5. _____						
6. _____						
3. Pit General Expense						
4. Power						
5. Repairs & Supplies						
6. Stripping						
TOTAL COST						

to conventions and all other expenses pertaining to administrative affairs.

3. Interest—To include interest of all kinds and exchange, if any. Interest items may be classified or charged as one item.

4. Salaries—To include salaries of officers and general managers.

5. Taxes—May be classified or entered as one item.

Office Expense

1. Depreciation.

2. Salaries—To include salary of bookkeepers, stenographers, and all office clerks.

3. Rent—Office rent only.

4. Travelling Expense—To include travelling expense incurred in collection of accounts, attending auditors' meetings, etc.

5. Telephone and Telegraph—To include rentals on office phones and all tolls pertaining to collection of accounts, securing cars, office supplies, etc.

6. Supplies—To include books, stationery, postage, trade letters, etc.

7. Miscellaneous—To include all items chargeable to office not included under other heads, such as janitor service, insurance, electric lights, water rent.

Sales Expense

1. Advertising—To include all souvenirs, newspaper or magazine ads and all expenses of a promotional nature.

2. Telephone and Telegraph—All tolls relative to sales and shipments.

3. Travelling Expense—To include only expense relative to sales.

4. Salaries—To include salaries of salesmen and sales manager, provided manager devotes entire time to sales.

5. Miscellaneous—To include any charges for commission or brokerage or other miscellaneous direct sale charges.

Operating

A. ADMINISTRATIVE

1. Depletion and Royalty—As defined in the Income Tax law.

2. Depreciation.

3. Demurrage—Demurrage only.

4. Insurance—To include all liability, fire, tornado, boiler and all other insurance directly chargeable to operating plant.

5. Obsolescence—Where machinery becomes worthless or obsolete before original value has been charged off to depreciation, then you are to charge the difference between the original value less depreciation and salvage value to obsolescence.

6. Switching—To include only switching charges assessed by railroads.

B. DIRECT OPERATING

1. Fuel—To include all charges for coal or fuel used to generate power for pumping or hoisting material; do not include electric power—See No. 4.

2. Labor—To include all labor at plant or pit except stripping, including superintendent's salary. If possible, classify.

3. Pit General Expense—To include travelling expense of superintendent, production manager, or laborers, telephone rental at pit, telephone tolls relative to needs at pit, and miscellaneous items.

4. Power—To include charges for electric current where plant is electrically operated.

5. Repairs and Supplies—All replacements to machines made necessary by wear or breaks, such as crusher parts, engine parts, boiler flues, screens, railroad ties, lumber (when used in repairing), waste, nails, bolts, belting, laces, packing, cable, ropes, rubber boots and suits, pipe and fittings, hose, boiler compound and small tools—all material for repairing railroad cars for loadings, to-

gether with freight, drayage and express paid for delivery of such items as are chargeable to repairs. Do not charge labor incidental to making repairs. This account to be charged off into Profit and Loss and not credited to equipment accounts.

6. Stripping—To include total cost of stripping operations—such as labor, fuel, repairs and supplies, depreciation on stripping machinery and all other miscellaneous cost pertaining to stripping.

Directions for Filling Out Form

In filling out statement form—enter all charge items in first column marked "Items," and only carry the totals of the Administration, Office Expense, Sales Expense and Operating Expense over into column headed totals.

Then divide said totals by tons produced; this will give "unit" cost per ton which is to be listed in "unit" column.

Producer Side of Price Controversy

Facts Show That Mineral Aggregate Men Have Not Added to Selling Price Even Total Increased Cost of Doing Business
—Prices Now Too Low to Spell Prosperity

SAND AND GRAVEL PRICES are too low for producers to maintain their plants and to continue successfully in business. Instead of declining, prices are more apt to advance. This is the consensus of Chicago producers who have gone over their books, including their bank books.

The gist of the testimony given to the Illinois legislative investigating committee in Chicago by producers shows that they are actually selling their product at a price that disregards the total advances they have been compelled to pay over the costs of two years ago. They are absorbing such a portion of the added expense that prosperity is an utter stranger. Figures supplied to the Dailey committee prove this.

Shows Net Loss of 13 Cents

Although it costs the American Sand & Gravel Co. 88 cents more to produce and deliver a cu. yd. of torpedo sand on the job than it did two years ago, the company is charging not more than 75 cents additional, a net loss there of 13 cents. If the increased cost of overhead were included, the showing of loss would be greater. Thus compared with the selling price of 24 months ago, torpedo sand is cheaper today.

When Parker M. Lewis of the American Sand & Gravel Co. went on the stand before the Dailey committee he submitted under questioning some figures. Here they are:

TORPEDO SAND

Two years ago delivered on the job, cu. yd.\$1.60

Add freight increase30
Add war tax03
Extra cost of production..... .20
Extra cost of cartage..... .25

Total\$2.38

These figures, it will be noted, do not include the increased cost of overhead.

Safe Conservative Figures

"We are selling the same material now," he said, "at \$2.25 and \$2.35 delivered, and even quoting less for large quantities for favorable deliveries.

"This is positively and undeniably a conservative and fair statement. In fact the figures could be higher and be justifiable. Even the price quoted for two years ago could quite properly be slightly higher. The figures given for extra cost of production and cartage are low, safely conservative."

Bank Sand Barely Takes Added Cost

A similar short statement covering bank sand was prepared by R. E. Thomas of the company for Rock Products.

BANK SAND

Two years ago delivered on the job, cu. yd.\$1.35
Add freight increase37½
Add war tax03
Extra cost of production..... .20
Extra cost of cartage..... .25

Total\$2.20½

Extra cost of overhead not included. This material is now selling for \$2@2.25, a gross increase of 85 to 90 cents as against an increased cost of 85½ cents, not including the added cost of overhead.

Hints and Helps for the Plant Superintendent



Announcing a New Department of Rock Products

FOR MORE THAN A YEAR the big problems of the rock products industries have largely occupied the time, the effort and the brains of owners and operators. It hasn't been so much a question of the best ways to operate—it was a question whether there would be any operation at all.

Under those conditions, much space in ROCK PRODUCTS was devoted to national issues and big business problems to the exclusion possibly of matter of more interest to the men at the plant. But now there is every indication that all the plants will be busy, and

operating problems big and little are going to receive more room for discussion.

With the assistance of the readers themselves, ROCK PRODUCTS intends to make this new feature of the greatest possible usefulness to the operating man. Descriptive notes accompanied by photographs, blue prints or rough pencil sketches for this department will be paid for liberally; and every contributor will have the satisfaction of knowing he is helping the entire industry to a safer, more efficient and more prosperous future.

Blast Holes—General Utility of Tamping Bags

QUARRYMEN generally realize the importance of tight tamping and of using proper tamping material. But proper tamping materials are not always available so they use whatever may be near at hand with the result that more explosives are often used than are necessary, increasing costs, or bringing down less coal or rock than could reasonably be expected from the quantity of explosives used.

Rock blasters are beginning to appreciate tamping bags made of heavy paper and used in many places as containers for sand, clay, or loam to be used for tamping. A supply of these can be filled and taken into the mine or on the job at the beginning of the day's work. The blaster is thus sure of having a tamping material that will give him maximum breakage at least cost. Their use also saves time when loading bore holes.

Tamping bags are very useful when the blaster desires to make up charges of blasting powder in cartridge form as they usually do when loading uppers or in damp open work. They are much more convenient than clumsily made funnels or cones for which pieces of newspaper are generally used.

The bags cost but a fraction of a cent each and their use will nearly always save many times their cost because of the saving in explosives or greater breakage from a given charge.

Proposed Method of Stripping

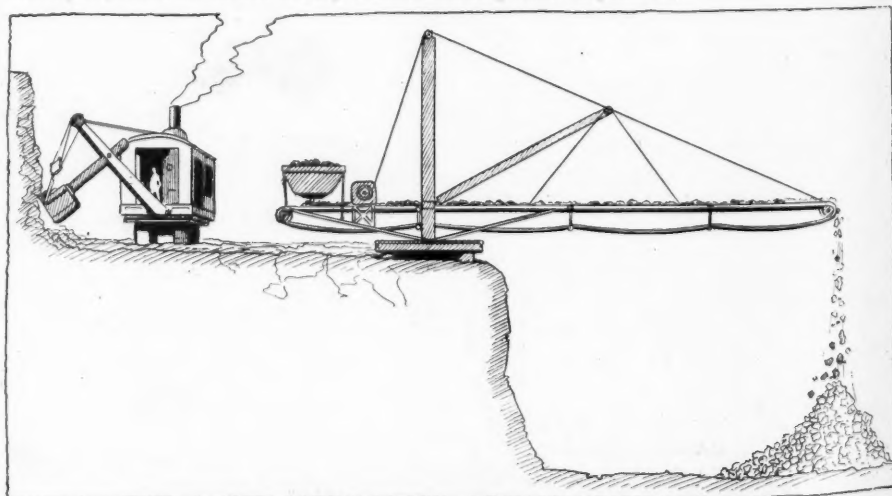
W. P. CARMICHAEL, the well-known contractor and sand and gravel producer of St. Louis, Mo., in discussing gravel stripping methods at the recent sand and gravel men's convention in Chicago, suggested the scheme shown in the accompanying sketch. Mr. Carmichael said the idea occurred to him from reading the description of the stripping machine at the Atwood-Davis Sand Co. pit (Beloit, Wis.) in ROCK PRODUCTS of December 18, 1918.

Instead of a traveling bridge, carrying a belt conveyor, as at the Atwood-Davis plant, Mr. Carmichael suggests a derrick with a belt conveyor hung from it as shown. The conveyor frame and the conveyor would be about evenly balanced

by having the motor drive (or gas engine) and the loading hopper on the short end, while the discharge end would be long enough to deposit the stripping in the excavated part of the pit. The derrick would of course require guy wires which are not shown in the sketch.

The conveyor frame would be so hung as to permit it to swing about on the mast pivot and thus give the stripping shovel some leeway, as well as making it possible to distribute the stripped material.

The device suggested by Mr. Carmichael had not been tried out when he described it. It is less easily moved than the traveling bridge device at the Atwood-Davis plant but would be considerably less expensive.



Proposed stripping device for quarries and gravel pits

Guarding Against Accidents

STATISTICS compiled by the Portland Cement Association show that 65 per cent. of all accidents to employees in the industry are caused by these four things: (1) Caught between parts (as machinery) or between objects (as cars); (2) falling things; (3) flying material; (4) sharp edges or points.

The quarry and crushing plant are by far the most hazardous parts of a cement works. However, the ordinary cement plant is generally a safer place to work than the ordinary crushed-stone or gravel plant, because a determined ef-



Stairway through a belt drive

fort has been made in the cement industry to prevent accidents.

The two pictures shown herewith are picked at random from a much larger collection to show two of the commonest dangers in the average crushed-stone and gravel plant.

The first shows an unguarded belt drive. The pulley is located under the platform shown. To go from the crusher floor level to the screens one must actually pass through this belt drive on a six-inch plank! The picture shows this foot-plank, the stairway approach and one side of the belt drive.

The second view shows an unguarded screen drive. This is one of the most frequently met with hazards of a stone or gravel plant. To get at the oil cups a workman frequently reaches over these gears, where a loose sleeve may cause the loss of an arm.

Such conditions as these may exist about a plant for years until some day a fatal accident occurs and the owners sit up and take notice. The pictures given are not horrible examples by any means; they are very common examples.

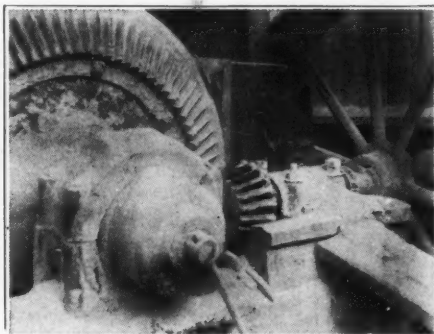
It is a matter of dollars saved to go over your plant and correct these conditions, because sooner or later they will be the cause of an accident for which the quarry owner will have to pay dearly, as well as be the cause of bringing grief to some poor laboring man and his family.

Where Bench Quarrying Is Most Economical

IT IS GENERALLY BELIEVED that in quarrying for crushed stone the

cheapest method under present labor conditions, and where a shovel is employed, is invariably to blast down the whole height of the working face at one time. However, there are instances where a better way may be found.

The picture shown is the quarry of the Columbia Quarry Co. near East St. Louis, Ill. It is being worked with well drills and steam shovels. Notice that the first 40 ft. of the rock from the top down is pretty well seamed and broken up, but at a point about 20 ft. above the quarry floor the seams end and the ledge is solid.



Unguarded screen gears

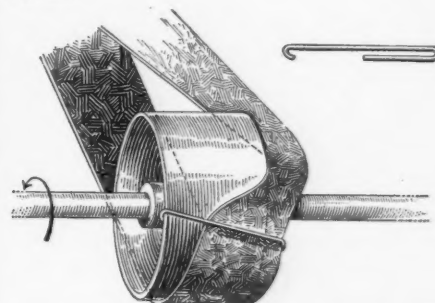
The quarrymen here have not been able to find a blasting formula which makes it economical to work this face. The upper part of the ledge is easily broken up and thrown out, but the bottom 20 ft. remains in such big chunks as to require a lot of "blistering" or "bulldozing," with a resulting high consumption of powder.

More than that, the big chunks at the bottom under the smaller stuff makes

the steam-shovel operation exceptionally difficult. Therefore it is now proposed to quarry down to the solid part of the ledge with well drills and deep shots as at present and to work the shovels on this floor. The bottom 20 ft. will be worked as a separate bench with tripod drills and more frequent blast holes.

Replacing Transmission Belts*

THE ACCOMPANYING ILLUSTRATION shows a simple device for replacing belts on pulleys in those cases where it is necessary to shut down to do so.



A piece of 5/16 or 3/8-in. round iron is bent as shown. The end with the shorter hook is placed against the pulley iron and the other under the belt, as indicated. Power is applied slowly; and, when the belt is in position, and provided that the iron used is sufficiently light, the short hook will straighten out and the device disengage itself without the necessity of again stopping the machinery.

*Engineering and Mining Journal.



Quarry face which should be worked in two benches

Crushed Stone Plant Served By Railway and Highway

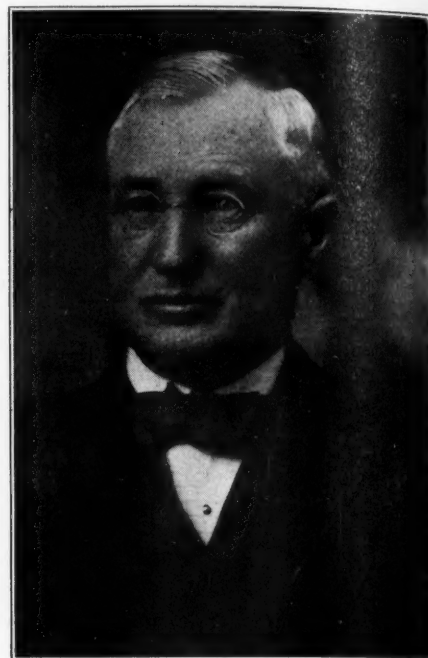
New Plant of Edward Hely at Cape Girardeau, Missouri

ONE OF THE NEATEST and prettiest crushed-stone plants in the South is that recently completed for Edward Hely at Cape Girardeau, Mo., shown in the view below. The plant is admirably located on the St. Louis & San Francisco R. R. and on the Rock Levee road, one of the principal north and south highways in the Mississippi Valley, on the outskirts of the town. It is adjacent to the plant of the Cape Girardeau Portland Cement Co., which buys all its limestone from Mr. Hely.

The stone is a hard blue limestone, which because of its hardness and abrasive value finds a ready market as far

north as St. Louis. It is the last rock outcrop in the Mississippi Valley. The country below, to the south, has long been known as "Swamp-cast Missouri," but much of it has lately been drained and is developing very rapidly.

The rock is quarried and loaded by hand into 2-yd. iron cars, which are hauled to the crusher by mules. Mr. Hely is using a revolving shovel for some loading, but more particularly for developing the quarry bottom and sinking holes for use in working the quarry when it becomes a pit operation. The tram track to the plant parallels the highway as shown in the view given.



Edward Hely



New crushed stone plant at Cape Girardeau Missouri, belonging to Edward Hely

The initial No. 12 gyratory crusher is placed 40 ft. below the ground level. The crusher output is elevated by a pan conveyor to a screen which removes the 1¼ and 2½-in. sizes. The 1¼-in. stone is taken away by a belt conveyor which carries it direct to the cement company's bin or storage pile on the opposite side of the railway tracks, as shown in the illustration. The 2½-in. stone is also conveyed to a bin. The rejections from the screen are fed by gravity to a No. 8 gyratory crusher.

The output of the No. 8 crusher is elevated to another screen which also takes out the 1¼ and 2½-in. sizes. The rejections of this screen go to a No. 6 gyratory. The output of this crusher goes by another elevator to a third screen which removes the ¾ and 1¼-in. sizes. This screen has a dust jacket to separate the screenings from the agricultural limestone dust. The rejections from this last screen go to rolls, which discharge to the same elevator serving the No. 6 crusher. The fines from the

first two screens are chuted to the third screen to separate out the dust.

The plant is so arranged that the No. 6 crusher and the rolls can be used for all the recrushing if necessary. The output of the screens can be sent either to the plant's own bins or direct to the cement company's bins, or storage pile without rehandling. The cement company occupies adjoining property. The cement company takes the stone from the bin or piles to the mill by standard-gauge cars and locomotives.

New Public Roads Director Named

Thomas H. MacDonald, of Iowa, to Be in Charge of Highway Work for Department of Agriculture

THOMAS H. MACDONALD, chief engineer of the Iowa State Highway Commission, has been appointed by the Secretary of Agriculture as engineer in immediate charge of the work under the Federal Aid Road Act, which provides for cooperation between the states and the Federal Government in the construction and improvement of roads. Mr. MacDonald will assume his new duties as soon as he can close up his work in Iowa. In the meantime he will continue to keep in close touch with the Federal Aid Road work of the department, as he has done during the past two or three months.

Steps already have been taken to expedite the resumption and extension of highway construction under the terms of the Federal law, as amended by the Post Office Appropriation Act, and nothing will be omitted to facilitate the vigorous prosecution of the work. The regulations have been carefully revised in the light of past experiences and of suggestions offered by the State Highway Departments, the standard for plans, specifications, and estimates have been modified to meet special conditions existing in some of the states, and other changes in practices and procedure have been made, all with the definite object of speeding up the work.

Mr. MacDonald will immediately supervise and direct all the activities of the Bureau of Public Roads under the Federal Aid Road Act, including the expenditure of the additional appropriation of \$209,000,000 provided by the Post Office Appropriation Act for the extension and development of highway construction during the present and the next two fiscal years. For the time being, in the midst of the pressure incident to the resumption and extension of road work, Mr. MacDonald will devote his energies to problems arising under the

Federal Aid Road Act. It is planned that, in the near future, he will formally assume the position of Director of the Bureau of Public Roads, made vacant by the death of Logan Waller Page.

Mr. MacDonald was graduated from the Iowa State College in the civil engineering course and was employed by the



Thomas H. MacDonald

Chicago Great Western Railroad for a time on track work. In 1904 he became Assistant Professor of Civil Engineering at the Iowa State College and was placed in charge of road investigation work. In 1906 he was appointed Highway Engineer with the first Highway Commission in Iowa and held this position until 1913, when he was made Chief Engineer of the present State Highway Commission. He is also supervisor of state roads, having charge of all highways and streets adjoining or upon state farms, state institutions, and the state capitol at Des Moines.

He is a member of the Executive Committee of the American Association of State Highway Officials. Mr. MacDonald's broad knowledge of and wide experience in highway construction matters peculiarly qualify him for the very important task of directing the activities of the Federal Government under the road act, in cooperation with the State Highway Commissions of the various states, and of supervising the expenditure of the large sums that are now available for this purpose.

Department of Agriculture Official Predicts Big Future Tonnage of Agricultural Lime

IN RESPONSE to a request for information as to the activities of the Bureau of Soils, Department of Agriculture, during the past year, Dr. C. C. Fletcher, scientist in charge of agricultural lime investigations replies as follows:

"The Bureau of Soils has done very little research work on lime in the last year as our energies have been largely devoted to war work, and our men have worked in cooperation with the War Department on pressing war problems, such as the utilization of atmospheric nitrogen. We have, however, continually advocated the use of lime and have answered correspondents from all over the country, who have asked advice on the use of this material. We have also endeavored to be of assistance to the lime manufacturers in securing preferential treatment from the different War Boards and Commissions, both in securing the material for new construction work and repairs, and an adequate supply of cars. While we did not in every instance secure everything we asked for, we felt that the farmers' interests demanded that the lime industry be encouraged and given its proper recognition. We believe that the rational use of agricultural lime should be encouraged and that the future will see a very much greater tonnage taken up by agriculture."

Cooperative Motor-Truck Routes and Agricultural Lime Distribution

Maryland Experience Helps Solve Transportation and Distribution Problems Irrespective of Railways and Freight Rates

THE FARMERS COOPERATIVE COMPANY of Harford County, Incorporated. This association appears to have met the needs of the rural community it is serving in a very satisfactory manner, and at the same time has eliminated effectively the problems of profit and destructive competition. This method is a decided departure from usually prevailing methods of operating motor-truck routes.

The association operates in Harford county, Maryland. Its motor trucks offer a daily round-trip service from Churchville and Bel Air to Baltimore, taking milk and other farm products to Baltimore and bringing back to the farmers feedstuffs, salt, seeds, fertilizers, farm implements, and other articles for use on the farm, together with merchandise shipped from the wholesale houses of Baltimore to rural merchants who are members of the association. The distance covered daily is about 60 miles.

Lime from Plant to Farm

The two paragraphs above are from the recently published "Farmers' Bulletin 1032" of the United States Department of Agriculture. This bulletin states elsewhere that in the spring of 1918 the trucks handled over 100 tons of agricultural limestone as well as many tons of other fertilizer from plant to farms.

The possibilities of this business will immediately suggest themselves to the rock products operator. Not only does it help solve the troublesome problem of transporting and distributing agricultural lime and limestone in small quantities, but were the scheme to be generally adopted throughout the country there would be a new and very powerful factor in the agitation for improved roads. And the roads to stand much of this kind of traffic would mean the consumption of vast quantities of rock products.

Details and Duties of the Organization

Some facts further in regard to this new farmer cooperative association are necessary to understand all its possibilities.

Membership in the association is based on ownership of stock. The association is authorized to issue 200 shares of stock of the par value of \$25 each, making the total authorized capital \$5,000. As the association is receiving many requests to operate over a wider territory but is unable to comply because of a lack of

funds with which to purchase equipment, a larger capitalization might have been warranted.

The management and administration of the Farmers Cooperative Company of Harford County rests in stockholders, officers, and a board of directors, ultimate control resting in the stockholders.

The officers and directors are governed by a constitution and by-laws which have been approved by the members, the terms of which are general.

No attempt is made to earn dividends. Transportation rates are made with a view to meeting the expenses, providing for depreciation, and accumulating a surplus to be used as working capital. In case the surplus fund should accumulate faster than the needs of the association require, then it is the purpose to reduce rates. Bearing these facts in mind, it is quite evident that rates and charges are low.

As compared with the service rendered by the railroad, the benefits are

very marked. Rates on many commodities are decidedly lower. In addition the congestion and embargoes of the past year would have greatly inconvenienced the farmers and rural merchants if they had been forced to depend on the railroad.

Cooperative Purchasing

Here is where the lime and limestone producer is helped again. Each farmer member of the organization communicates his needs as they arise to the secretary's office. The secretary then ascertains if other members are in need of the same commodities. This permits wholesale buying—a feature of great interest to the producer of bulky commodities like lime and limestone.

Payment for goods bought through the association may be made at the time the orders are given, or at the time of delivery, or the association will carry the accounts and submit them together with transportation charges to the members at stated periods for settlement. Goods not paid for at the time the order is placed or on delivery are bought on the credit of the association, most wholesalers being willing to extend the association credit for limited periods. As each member is required to settle with the association once a month, it can pay such accounts every month.

The Lime Manufacturer's Interest in the Potash Industry

Development of An American Potash Industry Would Mean a Big New Market for Lime

OUT OF 128 PROCESSES for the recovery of potash from silicate rocks, patented in the United States between the years 1905 and 1917 inclusive, 48 involve the use of lime or limestone directly while two use carbon dioxide which is best obtained by burning limestone. Three processes involve the use of gypsum and several of phosphate rock (calcium phosphate) which is closely allied to lime and gypsum.

The fact appears that most of the practicable processes for potash recovery involve either the burning (fusing) of potash-bearing rocks and limestone, or the treatment of the potash rocks with lime under steam pressure.

This, apparently, closely parallels the process in nature by which the potash of soils is released by the application of lime and limestone. No less an authority than Professor Frear of Pennsylvania State College is now advocating the use of lime for this specific purpose; for he contends that most soils have a potash reserve far in excess of ordinary crop

requirements. He even warns against the use of too much lime because it releases the potash too speedily.

If this country were to make one-half of the annual amount of potash imported, by working the potash-bearing rocks, it would probably mean the treatment of 3,000,000 tons of silicate rocks annually. Probably at least half this amount of lime would be required in the process, or 1,500,000 tons of lime is the possible consumption for this purpose, if the United States were to make only one-half of the 300,000 tons of potash annually required in this country.

The field is of further interest to lime manufacturers for the reason that inventors and agricultural authorities are beginning to take notice of the possibilities of lime-potash fertilizers. The whole rock-products fertilizer industry is indeed only in its infancy, and there is no reason why the industry of the future should not be in the hands of lime, gypsum and rock phosphate men instead of in the hands of the meat packers.

Selling Agricultural Lime and Limestone Through Farmers' Associations

Producers Are Not Making the Most of Farmer Organizations

THE BENEFICIAL RESULTS from the use of lime on a very large percentage of the soils east of the Mississippi River are no longer open to question. Lime in all its forms is slightly soluble in water, particularly in rain water, and the abundant rainfall in the region of the Mississippi valley and eastward has almost wholly depleted the surface soils of this ingredient. The problem of the farmer is to replace it in one form or another, for without it he cannot secure the best yields of alfalfa or the clovers. Upon the successful growing of these legumes depends the successful growing of other crops and the maintenance of the life of the soil.

Lime Gives Life to the Soil

The expression "life of the soil" has a meaning peculiarly its own. It does not necessarily mean fertility, although fertility depends on it almost entirely. A soil is not fertile unless it contains life in the form of millions of microscopic organisms whose function it is to draw nitrogen from the air and assist in releasing other plant food elements from the soil particles themselves. The organisms do not thrive except in the presence of lime to neutralize or destroy the acid condition so prevalent in eastern soils.

Nature has most wonderfully provided for this need of a neutralizer in the form of enormous deposits of limestone cropping out in many places in ledges and cliffs; but Nature refuses to quarry it and crush it and transport it to the fields. This is the problem for the land owners themselves and others interested in agricultural development to work out. In many respects it is a serious problem, especially for farmers whose lands will not grow clovers. In sections of Wisconsin and Michigan the land has become so worn out and sour that farms must be abandoned by the hundreds if this question of distribution is not solved soon.

The Farmers' Biggest Problem

There is one prospect that promises some relief. This is with reference to the handling of limestone products through farmers' cooperative associations. The cooperative principle is the most efficient one yet devised to relieve any economic situation, and it may be employed to advantage in this case.

Crushed limestone is a bulky product

By M. E. Duckles
County Agricultural Agent,
Grand Traverse County, Michigan

and difficult for local merchants and dealers to take care of satisfactorily at any price at which farmers can afford to buy it. When the local dealers' commissions and expense of handling are added to the high freight charges the cost becomes well-nigh prohibitive to purchasers depending on shipments from distant points.

We are assured by the companies engaged in putting out this pulverized limestone product that the cost of crushing has been reduced to practically a minimum; so if it is to be obtained more cheaply the burden would seem to fall on some other agency. In other words, it becomes a matter for the farmers and the railroads to contend with.

When it is fully realized that the wealth of the country is determined in the largest measure by the productivity of its soils and that the use of lime in large quantities is a factor to be reckoned with, our legislatures may take a hand and provide cheaper means of transportation to permit its application over wide areas. So widely beneficial would such action be that it could hardly be called class legislation. It would benefit all classes, from the original producer to the ultimate consumer, and add to our general wealth and well-being all along the line.

Cooperative Buying and Handling

In the absence of this much needed action there is but one way apparently to shave down the present cost to the farmer, and that is through cooperative buying and handling by associations of farmers organized for business of this kind.

A good many manufacturers look askance at farmers' cooperative concerns and hesitate to deal with them. It is true they have a rather unhappy record in so far as their stability can be counted on, but manufacturers should not continue to hold this grudge against them in view of the relatively small risk assumed in consigning goods with draft attached to bill of lading. It is to the interest of manufacturers to give farmers' cooperative associations all the encouragement possible. It is inconsistent and unjust to keep up the old practice

of "protecting the local dealer (the middle man)" at the expense of reduced sales and injury to a large number of buyers. This is especially true as regards the agricultural lime and limestone trade.

Now that every agricultural county of any importance has a Government farm agent to advocate this form of soil treatment and who is doing his best to get farmers to use it, the usual local advertising agent is hardly necessary. The county agricultural agent is anxious to see that the farmers secure their lime as cheaply as possible and naturally favors the cheapest source of supply. He really takes the place of an advertising agent.

Michigan Farmers Exchanges

During the past year a very significant movement has been going on in northern and western Michigan. This has been the organization of forty-eight exchanges united in what is known as the Michigan Potato Growers' Exchange, with central offices at Cadillac. The immediate purpose of these associations was to market the enormous potato crop of this region, at a price that would compensate the growers, eliminating the speculative feature incident to the old commission system. They are organized under Act No. 171 of the Public Acts of Michigan for 1903, and that they are proving successful and substantial is evident from the universal satisfaction expressed by the members.

Some of these associations have already turned their attention to buying farm supplies. Feed, salt, hay, spray material, machinery, binder twine, and clover seed have all been bought in car-load lots at remarkable savings. That crushed limestone will be included in the list is certain, provided of course no local agent shall receive a commission to which he is not entitled. The farmers want the lime and they must have it at the lowest possible cost; for, in order to cover the thousands upon thousands of acres that must be renewed after selling off the fertility taken out of the ground by the potato crop, a saving of fifty cents a ton, or even fifteen cents, would represent large sums of money compared with which high taxes are insignificant. Alfalfa or clover is the only salvation of the soil under the circumstances, and as has been pointed out, these crops depend on lime for their best yields.

Make Your Trade Association of Greater Benefit

A RECOMMENDATION that Congress give especial attention to the Sherman and Clayton Acts with a view to their immediate revision has been put by the Chamber of Commerce of the United States to a referendum vote of its membership. The proposals to be voted on are four in number and they employ the results of a special study of the situation made by the Chamber's Federal Trade Committee. They follow:

The committee recommends that Congress should at once consider the situation of all statutes constituting our anti-trust legislation.

The committee recommends that there should be formulated standards of general business conduct to be administered by the supervisory body.

The committee recommends that an enlarged Federal Trade Commission should be made the supervisory body.

The committee recommends that the membership of the Federal Trade Commission should be increased from five to nine.

The report of the committee after calling attention to a resolution adopted at the Annual Meeting of the Chamber in April, 1918, which proposed that in view of the economic policies inaugurated during the war Congress should be asked to consider a revision of anti-trust legislation and of the Trade Commission Act for the purpose of amending or replacing them in such a manner as to make this legislation reasonable, clear and adequate, points out that the present time is particularly opportune for re-making the laws.

The proposals and the vote follow:

Congress should be asked immediately to consider the present situation of all statutes constituting our anti-trust legislation—For, 1,543; against, 51.

In reconsideration of existing anti-trust legislation there should be formulation of standards of general business conduct to be administered by a supervisory body—For, 1,159; against, 389.

An enlarged Federal Trade Commission should be made the supervisory body—For, 1,102; against, 437.

In view of the importance of the functions of the Trade Commission as they would exist the membership of the Federal Trade Commission should be increased to nine—For, 1,104; against, 422.

The committee's report and the results of the vote are significant in view of the fact that the subject of anti-trust legislation will be taken up at the seventh annual meeting of the Chamber to be held at St. Louis April 28 to May 1.

Advantages of Open Price Competition

DURING THE LAST FEW YEARS a great many open price associations have been organized. Open price associations have for their purpose the bringing together of manufacturers of competing products, for the purpose of establishing trade practices and for the general welfare of the trade, to encourage a spirit of good will and mutual confidence among its members and with the trade, to cooperate with each other and with the government authorities, to prevent unfair methods of competition and trade abuses, to study and adopt ways and means of eliminating waste in production and distribution, to establish and maintain standards as to quality and to induce truthful branding of products, to

study manufacturing costs, devise scientific methods of accounting, and to furnish the members with useful information.

I believe wherever an open price association is established, the result will be better trade conditions, more uniform and more legitimate profits and a greater respect on the part of the consuming public. The cutting of prices below what will give a legitimate profit is not good for the consumer because in the long run what the consumer needs is stability in prices that are sufficiently low. He should not want an unfair advantage in the purchasing of goods, nor should he want a manufacturer to supply him with goods on which a reasonable profit has not been made.—G. W. Thompson, National Lead Co.

Professor Fippin of Cornell Joins Lime Association Staff

ELMER O. FIPPIN, professor of soil technology of Cornell University, will become director of the Agricultural Bureau of the Lime Association at the close of the present collegiate year.

Professor Fippin graduated from the College of Agriculture of the Ohio State University in 1900. For the next five years he was an assistant in soil survey of the U. S. Department of Agriculture and made soil surveys in the following states: Massachusetts, Connecticut, New York, Maryland, Georgia, Florida, Mich-

igan, Iowa, Missouri and North Dakota. From 1905 until the present time he has been assistant professor and professor of soil technology at Cornell University. During seven years of this time he gave all the resident courses in soils in the university and developed extension activities of the Agricultural Department.

Since 1912 he has confined his attention to extension work and the supervision of the soil survey of the state. He is author of a number of bulletins on soils published by Cornell University and joint author of the following books: "Principles of Soil Management" and "Soils, Their Properties and Management." He is the author of five chapters on soils, their character and improvement, in Cyclopaedia "Farm Knowledge." He is a member of a number of scientific and agronomic societies.

In making this change, Professor Fippin believes that the opportunity for constructive work in improving the soils of the United States and in increasing their productivity is greater with the Lime Association than with Cornell University because of the broader scope of its activities.

Agriculturists generally, throughout the United States, will be interested in knowing that thus a nationally recognized authority on soils becomes available to them through the enterprise of the Lime Association.



Elmer O. Fippin

Dolomite As a Refractory

Report of the U. S. Bureau of Standards on Possibilities of Developing a New Field of Usefulness for Limestone

IN MANY METALLURGICAL FURNACES it is necessary to use brick which are chemically of a basic nature. Magnesite brick are so used at the present time but are very high in cost. There are large deposits of dolomite all over the country. If the proper flux could be found to bind and coat dolomite particles so as to prevent rapid hydration of the lime, a dolomite brick could be produced which would replace to a great extent the magnesite brick.

Some work was done along this line but it had to be discontinued on account of lack of help and was not carried out to a practical conclusion. A number of different compositions were used. The most promising composition will be described.

The brick was made of two parts, one of burned material known as grog which formed the skeleton of the brick, the other part of unburned material known as binder. The grog portion was made by burning to a temperature of 1500°C. a mixture of 90 per cent dolomitic hydrated lime and 10 per cent of a special flux, the mixture being ground to pass a 100-mesh sieve. The flux was produced by burning to a temperature of 1400°C. a mixture of equal weights of dolomitic hydrated lime and impure bauxite, ground to pass a 100-mesh sieve. The binder consisted of 85 per cent of the dolomitic hydrated lime and 15 per cent of the flux.

The brick were made by mixing thoroughly 70 per cent of the grog (of 6 to 40 mesh size) with 29 per cent of the binder and 1 per cent of iron oxide, and molding in a power press. The brick was dried in an oven at 110°C. and burned to a temperature of about 1500°C. and Seger cone 20.

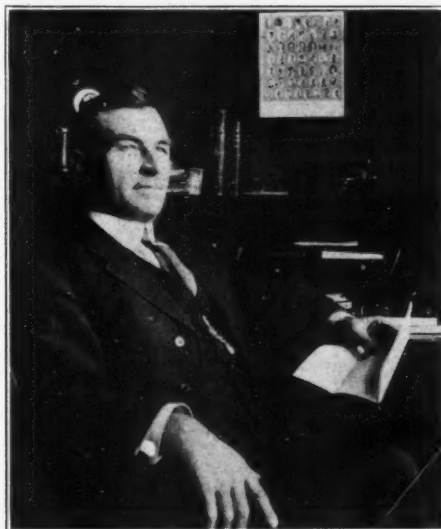
The specimens molded with a pressure of 2,500 pounds per square inch appeared to be most satisfactory. Some of the specimens when placed in water resisted hydration for 6 days. Others when left in the open air in the laboratory remained very hard and did not begin to hydrate until they had stood for six months. These results would indicate that such a brick placed in a furnace would resist hydration and disintegration for a much longer time.

Hydrated lime was used because a large supply was on hand at the laboratory. For the grog portion and for the flux the hydrated lime could be replaced by ground dolomitic limestone. The binder must be a finely ground material which will not hydrate and cause disintegration in drying and burning. The possibilities for this purpose are hydrated lime, ground dolomitic limestone, ground slag, Portland cement.

The question of costs has not been gone into nor has any attempt been made at a practical application of the method, but the results indicate that the problem can be solved by sufficient experimental work.

Field Booster of the National Agricultural Limestone Association

C. R. Wagner, whose portrait is shown herewith, has accepted a position with the National Agricultural Limestone Association. He is field representative. In making the announcement, A.



C. R. Wagner, field representative of National Agricultural Limestone Association

P. Sandles, executive secretary of the association, thus describes him: Mr. Wagner is a real farmer, not a white-shirt job agriculturist. His farm, Hancock County, Ohio, is in high state of cultivation. His marked success as a farmer attracted the attention of the State Agricultural Department more than 20 years ago. He was asked to do farm institute lecture work. He accepted the invitation. His common-sense and practical experience made him a useful man in institute work. He has spoken to and helped farmers in every county in Ohio. His helpful hints and suggestions have put money into the pocket-book of nearly every farmer.

For some years he was State Director of Farm Institutes. In recent years the Ohio State University has employed him in its agricultural activities. For many years Mr. Wagner has had faith in agricultural limestone as a soil corrective. He will respond to a limited number of calls to deliver addresses to farmers on up-to-date rural welfare questions.

Lime Association to Investigate Solubility of Limestone

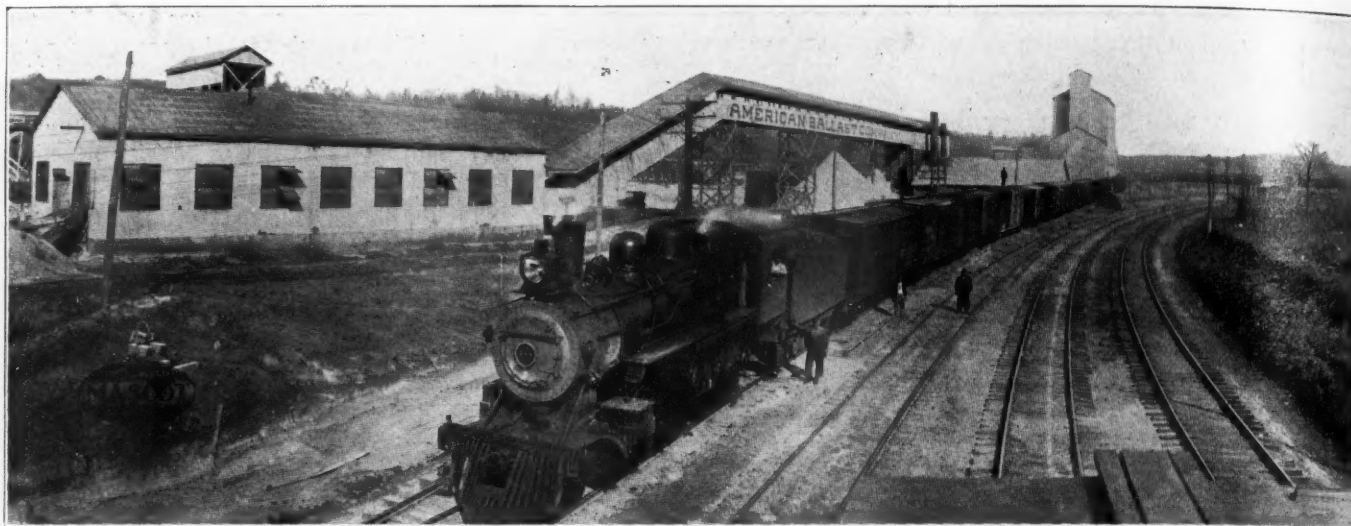
ROBERT F. HALL, manager of the Lime Association, announces that: "In an effort to determine the solubility of limestone, particularly as it relates to the agricultural situation, the Agricultural Bureau of the association requests member companies to forward to the office by parcel post representative samples of their lime-rock, and where more than one grade of lime-rock occurs in their quarries, to forward us a representative sample of each grade. This sample should consist of not more than 10 nor less than 5 lbs. of crushed rock, all of which should pass a 2-in. ring. Each package should be carefully labeled, giving information as to what quarry it was taken from and such other information as will make it possible to identify that rock at a later period should occasion require.

"Where member companies can furnish an analysis of the rock submitted it would be much appreciated, although this is not absolutely essential.

"The association would also like to receive samples from non-member companies. This work is part of the program laid out by Committee C-7, American Society for Testing Materials, and the lime industry is asked to help carry it on."

Conversion of Quicklime in Soil—Limestone Slower

WHEN LIME IS ADDED to soil only a small part reappears as calcium carbonate, the remainder being adsorbed by the soil, and no calcium hydrate being recoverable even after very short digestion. The adsorption may be due to surface action or to chemical causes, and is associated with the observed increased absorptive power of the soil for other bases (potash and ammonia) which results from an application of lime. The adsorptive power of the soil appears to be related to its content of clay and the presence of unsaturated compounds and normally an equilibrium is soon reached between the adsorptive and absorptive power of the soil carbon dioxide and the soil compounds, respectively. With limestone the action is slower and months may pass before equilibrium is reached. (Chem. Abs. 13-2.)



Removing 80 Per Cent of Water From Agricultural Limestone Dust

Plant of the American Limestone Co. Converts Zinc-Mine Tailings into High-Grade Fertilizer Material

PROBABLY THE CHEAPEST and most efficient method of conveying any fine material is by sluicing and pumping a water mixture of it. Fine sand is often hydraulicked in this way very cheaply, as has been described in numerous issues of *ROCK PRODUCTS* within the last year. The following article describes how limestone dust is handled in the same manner, and how the 80 per cent of water it contains is reduced to 20 per cent before the material gets to the rotary dryers.

Besides being a rather unique plant for the production of agricultural limestone, the process has other applications in the rock products field as a few progressive cement manufacturers have found out when use was made of this process to de-water slurry before feeding it to the kilns, thereby effecting a huge saving in fuel. Doubtless there are other possible applications in the rock-products industries.

By-Product of Zinc Manufacture

The limestone dust is the "slime" in mining terms which is wasted in the recovery of the fine particles of zinc ore in the original limestone. The limestone is mined, crushed and pulverized and the pulverized product is concentrated by various processes, in which the flotation process plays an important part. The flotation process is nothing more than an elaboration of hydraulic classification such as takes place in the sand settling box of any sand and gravel plant.

The particles of zinc ore being heavier



Dorr thickener and filter house

separate out from the limestone particles which are carried away in the wash water. The limestone is rejected in two grades or sizes, one about the consistency of coarse sand or fine gravel and

the other a very fine material (such that 80 per cent will pass a 200-mesh and 90 per cent a 100-mesh screen).

The zinc ore occurs in certain strata of dolomitic limestone which is a high grade calcium-magnesium carbonate. In mining only these strata of limestone are removed so that a more than ordinarily uniform material is available for the limestone plant. The fine material from the zinc plant waste is indeed only pulverized calcium carbonate (52 per cent) and magnesium carbonate (38 per cent). The problem was to remove the



Thousands of tons of "crusher sand"—Thos. McCroskey, general manager

80 per cent of water in which the dust is carried.

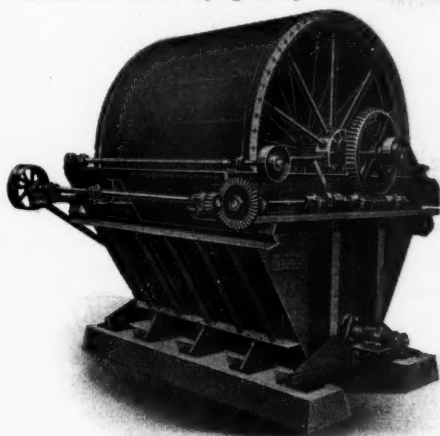
Sluiced to Limestone Plant

The plant of the American Zinc Co. at Mascot, Tenn., is on one side of the valley and the American Ballast Co. is on the opposite side—a distance of about 1,000 ft. The limestone dust and the water which carries the dust are sluiced this distance in an overhead flume, shown in the accompanying views.

This flume discharges to a Dorr continuous thickener—a well-known piece of mine-plant machinery, but not yet used to any extent in the rock-products industry. This device is a large cylindrical settling tank provided with a central shaft, which has radial arms with plows to bring the settled material to the discharge opening. The cleared fluid overflows at the top of the tank. The thickener removes about half of the water from the limestone dust.

Battery of Filter Presses

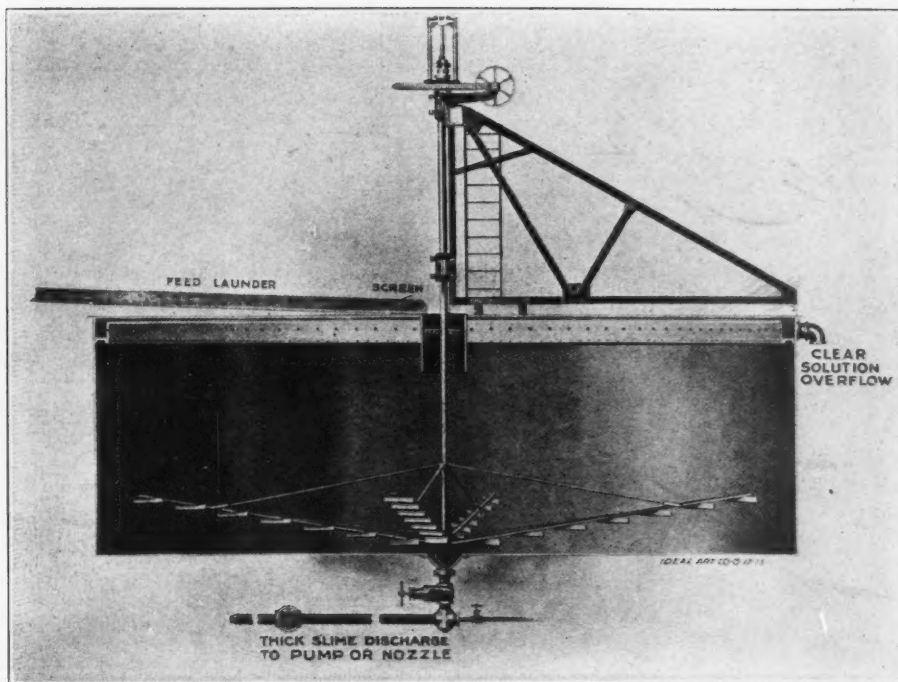
The thickened discharge of the Dorr thickener flows by gravity to a battery



Details of a Portland continuous filter

of three 14 ft. in diameter by 14 ft. face continuous vacuum filters of the revolving drum type. This is another common piece of mining equipment. A filter of this type consists of a series of panels carrying a porous filter medium (like burlap or canvas), arranged in the form of a drum which rotates in a tank containing the material to be filtered (or in this case the material to be de-watered). Each panel is provided with air suction inlets, as subsequently described, and each section or panel operates independently by means of an automatic air valve.

The drum revolves slowly (one revolution in 5 to 8 minutes) and as each panel or section is submerged in the tank a vacuum is created on the inside of the inlets and a layer of the wet material clings to the exterior of the drum. The drum carries its cake of material to the opposite side of the machine where the



Cross-section of a Dorr thickener—a type of settling tank

air current is reversed; the cake is loosened by the compressed air (5 to 10 lb. per sq. in.) and is scraped off upon a belt conveyor.

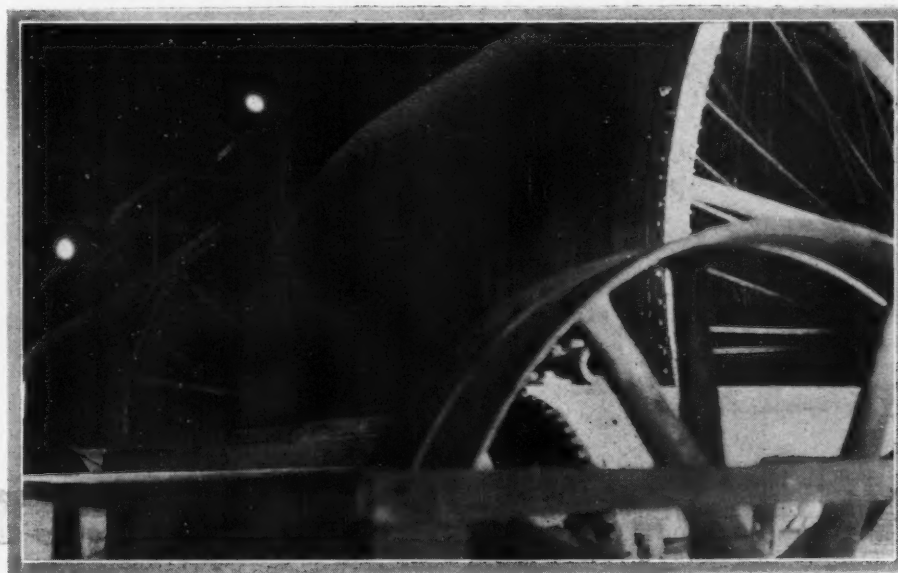
The cost of de-watering with this type of filter is about 4 cents per ton of dry material, according to the manufacturer of the device. The amount of water removed is about 50 per cent of that remaining in the material as it comes from the thickener, so that the discharged material contains but 20 per cent moisture and is therefore not much damper than limestone screenings exposed to the weather would be.

The limestone dust as scraped from the filter drums is carried by a belt conveyor to the dryer house, where it is fed to a battery of three direct-fired rotary

dryers. From the dryers the dust is carried by a belt conveyor to the bin and packing house beyond.

Crusher Sand Also Used

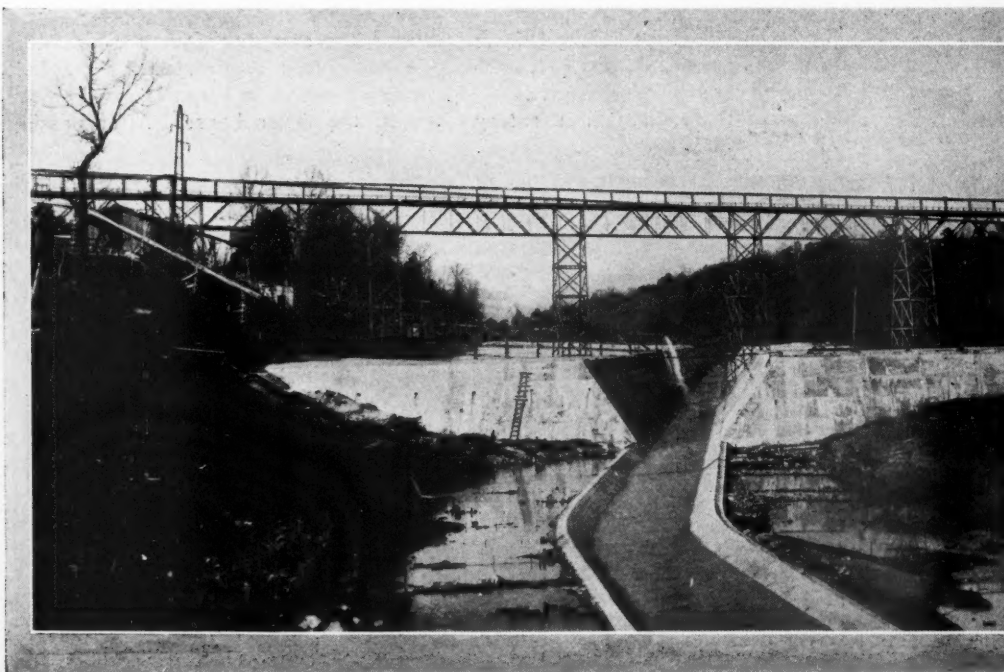
To supplement the material which comes to the limestone plant already in a fine enough state to be utilized for agricultural purposes, a means is also provided for using the coarser material or crusher sand. This is sluiced to the limestone plant in cast-iron pipes which deposit the material in a pile or bank alongside the drying and packing plant. Here the material drains and is air dried. A drag-line scraper recovers it from this pile and feeds the material to a belt conveyor, which in turn carries it to the top of the dryer house. After passing



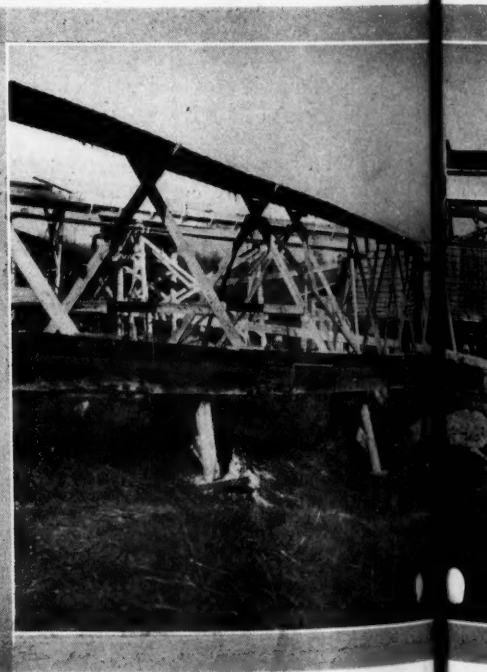
Battery of 14 x 14-ft. drum filters for dewatering fine limestone dust



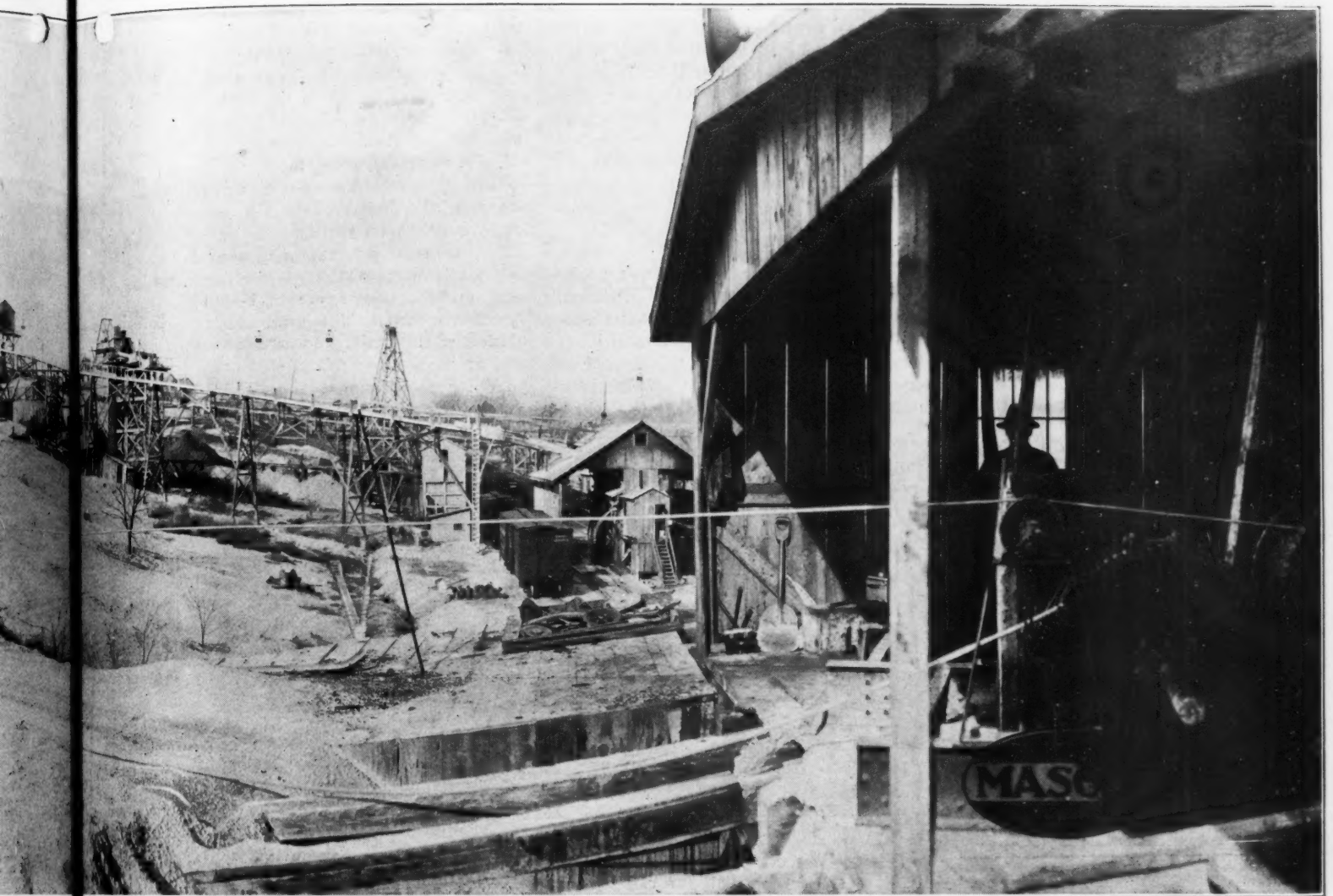
Plant of American Zinc Co., Mascot, Tenn., showing mountain of waste limestone-crusher



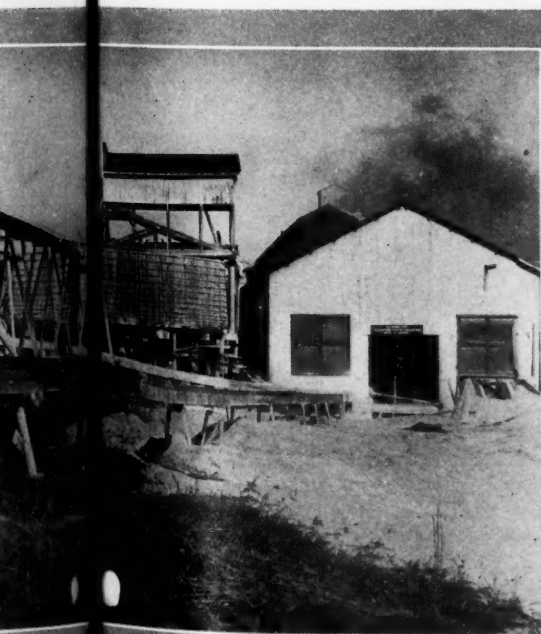
Flume for conveying dust from zinc-recovery plant to agricultural limestone plant



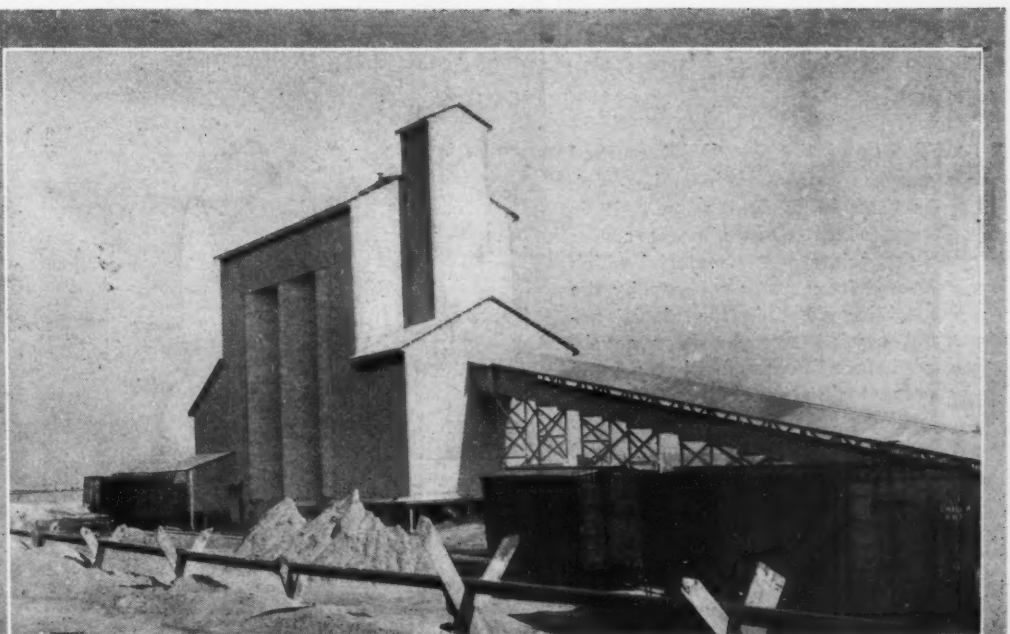
Close-up view of Dorr thickener and



the limestone "crusher sand"—sold for railway ballast and ground into agricultural limestone



Blackener and filter house for recovery of limestone dust



Concrete storage bins and packing and shipping plant for agricultural limestone dust

through one of the rotary dryers the material is fed to pulverizers and is then conveyed to the bin and packing house along with the other fine material from the dryers.

The crusher sand, with a small percentage of fine material added, makes an ideal concrete aggregate and a considerable market for it is being developed along this line.

Shipping and Packing Plant

The agricultural limestone is shipped both in bulk and in bags. For bag shipments a valve-bag packing machine is conveniently located under the bins. For bulk shipments an interesting piece of equipment has been developed at this

plant. It consists of a portable screw conveyor, which takes the dust from an elevator at any bin and discharges it through a 12-in. pipe to the inside of a box car. This machine is driven by an electric motor and the whole unit is mounted on a track at right angles to the box car being loaded, so that the discharge end can be pushed into the car.

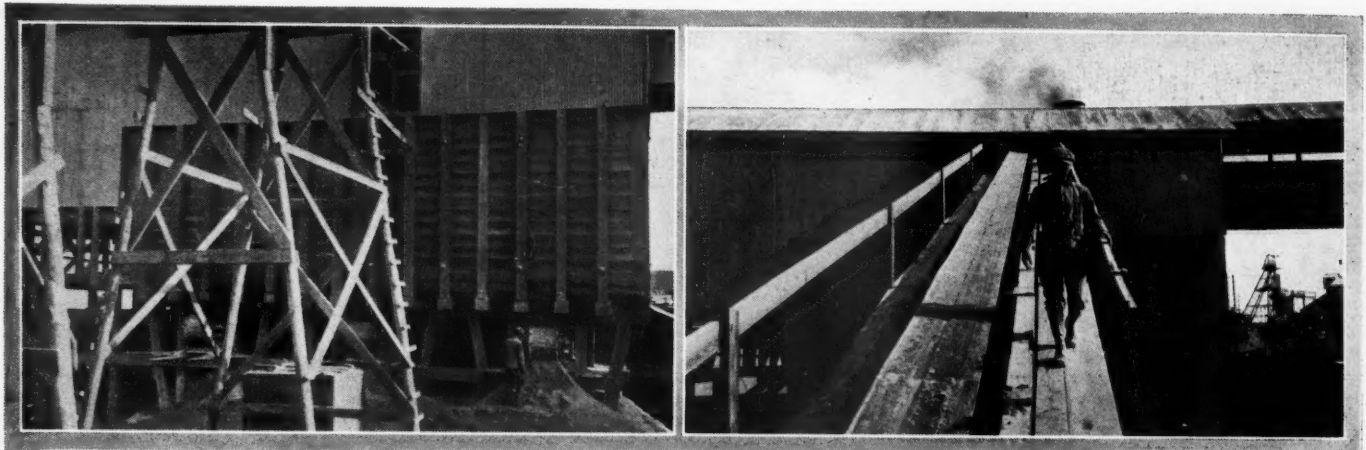
Formerly American Ballast Co.

The American Limestone Co. is a subsidiary of the American Zinc Co. Thos. McCroskey, of Knoxville, Tenn., is general manager. Besides agricultural limestone and crusher sand, this company also sells a large quantity of limestone mine tailings or chats for railway bal-

last. This material is loaded from the mine dump by means of a drag-line and does not go through the limestone plant described. It was this business that gave the company its original name—the American Ballast Co.

The limestone plant turns out from 800 to 1,000 tons of agricultural limestone per day, the ballast sold amounts to 2,000 or 3,000 tons per day.

Not the least interesting of the company's various operations is the farming of several hundred acres of land adjacent to the plant. This farm specializes in blooded livestock and is a dividend-paying proposition in addition to its value for experimental and demonstration purposes.



Above—Dryer house showing ends of pan-conveyors serving dryers. Above to right—Belt conveyor for crusher sand to dryers. To right—box-car loading machine for bulk material.

Why the Output of a Portable Crusher Is Poor Stuff

MOST OF THE "NATIVE" crushed stone has come not from bed-rock outcrops, but from field stone. It is therefore not native, in a strict sense; because the field stone is material which was collected from many sources, by the continental ice sheet, in the glacial period, and carried southward or south-eastward before it was finally dropped in its present situation.

As a rule most of the stones and boulders were carried only a few miles, and so correspond rather closely to the prevailing rocks of the locality where they lie; but a fraction of them, amounting sometimes to nearly 50 per cent., are different in composition from the underlying rock structure. Naturally, where fragments have been collected and scattered so widely, there is a wide variation in the composition of field stone, as may be easily seen by comparing the proportion of certain kinds of stone (such



as granite and slate) in the stone walls in certain localities with that of other localities.

The common practice of making crushed stone from the nearest available stone walls, therefore, is to be avoided, unless a study of the character of the rocks that constitute these walls is made. —J. W. Goldthwait, New Hampshire State Highway Department.

Indiana After Solution to Freight Rate Matter

INDIANAPOLIS, Ind.—The freight and traffic departments of the Indiana State Chamber of Commerce and the Public Service Commission of Indiana are working in conjunction seeking to solve the freight rate matter.

Lime From a Gas-Fired Continuous Kiln

Some Principles in Kiln Operation and Their Application to a New Vertical Kiln—
Four Already in Successful Operation at Farnam Cheshire Lime Co.,
Farnam, Mass.

THE CONVERSION OF CALCIUM CARBONATE to lime is a chemical process which may be carried on lacking entirely any chemical knowledge, and with but a moderate amount of technical skill. As the carbonate is decomposed at a red heat it is apparently only necessary to apply the heat for a short period, and the result is lime, regardless of considerations of economy.

Every step and every factor, however, in the operation of lime burning has a definite significance, and the production of high grade lime with high grade economy is as truly a technical process demanding skill and knowledge, as any other chemical manufacture. There is need of trained chemists and engineers in this industry to put it upon a distinctly scientific plane.*

As every step and factor in the process have a definite bearing on the final outcome, they must be under complete and constant chemical control. Therefore, it is not only necessary that such control be provided, but the design of the apparatus must be of a character that the control can be made effective; otherwise, it will be impossible to realize that continuity of operation and co-ordination of the various factors, so essential to uniformity in quality and quantity of output and the attainment of the highest efficiency and economy.

It is doubtful if the salary paid a trained chemist could be invested to better advantage, or be more productive of desired results in any industry than in the manufacture of lime and lime products. However, as already indicated, it is not a problem for the chemist alone, but his work must go, hand in hand, with that of the engineer. Chemical control cannot be effective in the highest degree, except the design is of a character to permit the regulation of all those factors having a direct bearing on the final result.

Factors Necessary for Chemical Control

The foregoing statements as to the necessity and effectiveness of chemical control lead naturally to a consideration of problems of design, preliminary to which, however, it is well to call attention to certain specific factors having a direct and important bearing on the operation of the process. It seems to be the accepted opinion, backed by many years of practical experience, that wood, both technically and as regards quality

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of product, is the most desirable fuel.

It is not my intention, however, to consider the merits of a fuel now unattainable, or at least practically so, but to accept without discussion, the most generally available fuel approximating the good qualities of wood; namely, pro-

THIS PAPER IS OFFERED

for the purpose of bringing to the attention of lime manufacturers a system by which lime can be economically burned, showing a ratio of 1 to 5 or 6, coal to lime, depending on the quality of coal, in a kiln of 8-ft. diameter, producing, at the same time, 25 tons of lime per day, and lowering the cost of repairs per ton of lime.—
The Author.

ducer gas, made from bituminous coal low in sulfur, in a modern producer-gas machine, so located and operated as to deliver to the kilns the maximum number of B.t.u. per cubic foot of gas. Moreover, that coal will be used, regardless of price, which will give the greatest number of pounds of lime for a dollar.

It would seem axiomatic that a kiln of the shaft type, other things being equal, will have the highest fuel economy when so operated as to be cold at the top and cold at the bottom, and that its capacity, under these conditions, will be greatest when discharging continuously.

Temperature of burning is an important factor, both in the quality of the product, and in the economy of production. Economy in manufacture requires that the temperature of burning should not be greatly beyond that needed for the complete removal of carbon dioxide.

* * * The time required for slacking limes burned at different temperatures shows clearly that the sensitiveness or quality of the lime is materially affected by any great overheating.†

Temperature Control

In the use of heat it is necessary, not only as effecting the reaction, but on the grounds of economy, that definite control of temperatures be possible, and in many industrial operations control

must be effective to within a few degrees to insure the greatest success. Therefore, it seems essential in a well designed kiln for producing lime, that suitable provision should be made for determining and maintaining the proper temperature necessary to the production of the best quality of lime possible, from the stone to be burned.

Overburning from too high temperatures, or the production of core from insufficient heat are alike undesirable qualities. Fortunately the burning of calcium carbonate to lime is not like some other heat operations, in that a fairly wide range of temperatures is permissible, without materially endangering the quality of the product; though from motives of economy, as effected by kiln capacity, it is desirable to approach as near as possible the safety limit of the maximum allowable temperature, as the quality of the product will admit. Hence the importance of close regulation, regardless of the considerable range of temperature, within the limits of which the kiln may be safely operated.

The question of draft is important, not only as affecting the capacity of the kiln, but from the standpoint of economy. Induced draft is preferred, as it is independent of height of kiln, and size of material charged, and can be controlled by the operator in charge.

Prevention of Over-burning

When de-carbonizing has proceeded to the point where all gas has been expelled, the lime should be promptly removed, out of the zone of intense heat, into the cooling zone; first, to prevent "dead burning" and recarbonization, due to exposure to the combustion gases; and second, that the cooling may be progressive following the principal of the counter current; the hot lime giving up its heat to the incoming air for combustion, cooling the one and preheating the other.

The removal of the lime from the reaction to the cooling zone, and its final discharge from the kiln would be continuous, and is an important feature of the design, inasmuch as the discharge mechanism will, in operation, bring about a slight but perceptible movement through the entire mass of the charge in the kiln, tending to stabilize the draft; prevent clinkering, and hanging up of the charge, and improve the life of the brick lining.

The length of time required for the

* Geological Survey of Ohio Bulletins, 4 & 5, Orton & Peppel.

† Geological Survey of Ohio Bulletins, 4 & 5, Orton & Peppel.

lime stone to pass through the reaction zone will depend on several factors:

First: The size of limestone blocks fed to the kiln. The smaller the blocks the less will be the time necessary for the heat to reach their center, other things being equal.

Second: The amount of preheating the stone has had, prior to reaching the reaction zone, as well as the kiln pressure.

Third: The nature of the fire, its volume and intensity, and its close regulation.

Fourth: Continuous movement of the stone through the reaction zone.

If a continuous stream of stone can be kept passing through the reaction zone at a rate that would insure the complete burning of the stone to lime, and no more, it would be of advantage to the quantity and quality of the product, for the reason that the constant movement would keep turning the stone, giving equal exposure on all surfaces.

Continuous-Discharge Gas-Fired Kiln

The design of the continuous discharge gas-fired kiln is not, as will be noted from the cut, altogether a radical departure from the standard of the more modern kilns of the shaft type. Neither the use of producer gas, induced draft, nor the idea of cold lime from the bottom of the kiln are essentially new. On the contrary, these ideas have been tried, with more or less success, in the past. The principal characteristic of the design is a careful balancing of parts for the specific purpose of permitting that close chemical control, without which continuity of operation, uniformity in quality and quantity of product, and the highest efficiency and economy are impossible.

It may be assumed, without question, that uniformity in output presupposes a similar condition as regards input, and that the former cannot be safely predicated on variable conditions as regards the latter. Therefore, in addition to certain essential conditions, already indicated, we should specify stone of uniform size, within prescribed limits, clean and free from dirt, and charged in predetermined quantities at regular intervals; close regulation of the draft, and quality of the exit gases and their temperature; also close attention to regulation of the temperature in the reaction zone.

For the purpose of description the kiln may be divided into three sections or zones (from bottom upward), (1) Cooling, (2) Reaction and (3) Preheating. At the bottom of the cooling zone is located the continuous discharging mechanism, and at the top of the zone the inlet tuyeres, admitting the fuel gas from the producers to the reaction zone. The design of the tuyeres is important in

order that a uniform distribution of the fuel gas may be insured throughout the mass of stone in the reaction zone; otherwise, there would be a tendency for the gas to creep up the sides of the kiln, causing over-burning at the sides, and under-burning or core in the center.

The reaction zone is encircled with three belts, or rows, of peep holes for observation. The couple of the recording pyrometer is located in the middle belt. The boundary line between the reaction and preheating zones is not, of course, very sharply defined, but it may be roughly assumed that the preheating zone is comprised within the limits of the upper half of the kiln, and the reaction zone the fourth next below.

Gas is admitted from the producers, to the reaction zone, through water-cooled balanced valves, easily regulated from the ground, where are located the temperature gauges for each kiln. The

continuous discharge mechanism, at each kiln, is driven from a common shaft, but can be stopped or started independently of the balance of the kilns in the battery. The speed of discharge is figured to 25 tons of lime per day of 24 hours; though means are provided for varying the speed of the common driving shaft.

The top of the kiln is closed, and in the cover is located a hopper and charging bell, the latter raised and lowered by compressed air, and designed to give a uniform distribution of the stone over the top of the kiln, maintaining the surface level at all times, insuring an even distribution of the gases in the preheating zone. At the top of the kiln is also located the draft pipe for the exit gas, regulated by a valve of the same type as that used for the fuel gas.

The total height of the kiln to the level of the charging floor is 60 ft., and from the bottom of the cooling zone to the top of the preheating zone 48 ft. The diameter, maximum, 8 ft. inside the brick work. The stone is charged in uniform batches of 1,000 lbs. and at regular intervals of 15 minutes, or 4 periods per hour, for a capacity of 25 tons per day. The draw is continuous, and can be arranged at any section of the bottom circumference, where most convenient. The cold lime being removed in barrows, or conveyors, for hydrating, storage, or direct to cars for shipment.

The preferred arrangement of the kilns is in batteries of six, with a Morgan continuous producer-gas machine located midway of the battery. This combination, under proper control, will have a capacity of 150 tons of lime per day, with a coal to lime ratio of 1 to 5 or 6, depending on the quality of the coal.

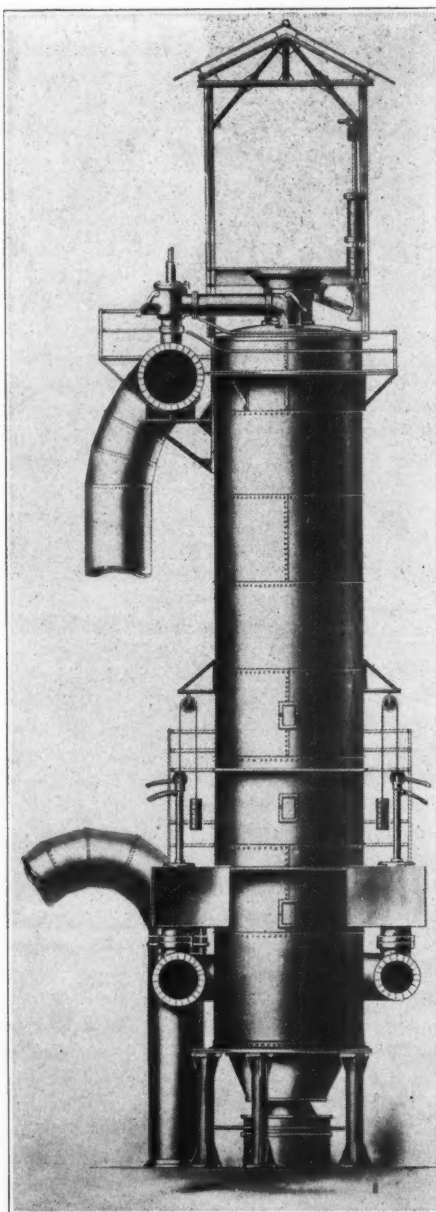
Four kilns of the above type have been in constant service at the plant of the Farnam Cheshire Lime Co., Farnum, Mass., for a period of over five years, and have given excellent results in economy of operation, capacity and quality of product.

Nebraska Discovers Necessity for Agricultural Lime

REPLIES to a request for information on the lime laws of the various states recently sent out by the Lime Association brought out the fact that the state of Nebraska has no lime law, but the State University authorities stated:

"As a matter of fact, very little lime has been used for agricultural purposes here in the state. We are this year using it at a number of places and just had a carload shipped to be tried on some acid soils."

The Lime Association has offered to cooperate in establishing plot tests with the university.



Continuous-discharge gas-fired kiln

The Use of Lime in the Sugar Industry

High-Calcium Very Pure Lime Is Required—Carbon Dioxide Used Requires Some Limestone to be Burned on Premises of Sugar Factory

LIME IS THE MOST IMPORTANT CHEMICAL, and the one used in largest amount, in the purification of juices in the process of manufacturing sugar from both beets and cane.

The magnitude of its use in the beet sugar industry can be seen from the following figures. While no statistics of the actual consumption of lime in the domestic beet sugar industry are on record, the beet sugar factories of the United States during the 1917-18 "campaign," or operating season, worked 5,625,545 tons of beets. As a conservative figure, it may be estimated that they used on the average about three per cent lime on beets. This would be equivalent to a consumption of about 170,000 tons of lime, and it is possible that the actual consumption may have been nearer 200,000 tons.

Action of Lime on Beet Juices

In the process of manufacturing beet sugar the beets are first sliced and the sugar, as well as some unavoidable impurities, is extracted by the action of hot water which is brought upon the sliced beets in a series of iron vessels constituting the "diffusion battery." The raw juice from the diffusion battery is pumped to a "carbonation tank," where it is heated and milk of lime, equivalent to about 2.5 to 3.0 per cent lime on beets, is added, and carbon dioxide gas (from the lime kiln) is introduced until practically all the lime is neutralized and precipitated as insoluble calcium carbonate, which is removed by filtration in filter presses.

The combined action of the heat, the lime, and the precipitation of the calcium carbonate, results in the removal of most of the deleterious impurities from the juice, the sugar remaining in solution. Except for the use of a little sulphur dioxide and the occasional addition of soda ash to remove organic lime salts, lime is the only chemical used in the purification of beet juices. While two or three hundred other chemicals have been proposed and many of them tried, the use of lime in the so-called "carbonation process" is still the standard method of purifying beet juices throughout the world.

Source of Lime in the Beet Sugar Industry

Every beet sugar factory produces its own lime on the factory grounds by burning a mixture of limestone and coke in a continuous, shaft kiln. This is done

By S. J. Osborn
General Chemist, The Great Western
Sugar Company, Denver, Colo.

not only because the lime production is of such magnitude, but because the carbon dioxide gas produced by the decomposition of the limestone is needed in the carbonation process as well as the lime. The gas would of course not be available if the lime were burnt at the quarry or any outside location. The kiln draft is regulated by a gas pump of sufficient capacity, which aspirates the gas from the top of the kiln and forces it through the distributors in the carbonation tanks.

If only the gas produced by the decomposition of the limestone were available, there would still be a deficiency because just as much gas as was originally combined in the limestone is needed to reunite with the lime and the efficiency of absorption in the carbonation is far from perfect. This is fortunately overcome, however, by the fact that the coke used as fuel also forms carbon dioxide as the product of combustion, thus yielding a total amount of gas considerably in excess of the quantity required.

The following calculation which is based on average conditions, shows just how much excess carbon dioxide is available. Let us start with a basic amount of 100 tons of limestone, to burn which 10 per cent coke on stone, or 10 tons, is used. If the limestone is assumed to contain 97 per cent calcium carbonate and the coke 90 per cent carbon, the limestone will yield, according to the molecular weights, 42.7 tons of carbon dioxide, and the coke 33.0 tons, or a total of 75.7 tons. The limestone will also yield 54.3 tons of calcium oxide which will require 42.7 tons of CO₂ for neutralization. If the efficiency of the carbonation, i. e., the percentage of carbon dioxide absorbed, is assumed to be 70 per cent, the amount of carbon dioxide required will be $42.7 \div .7 = 61.0$ tons. The amount available found above (75.7 tons) exceeds this by 14.7 tons, or the total available is about 25 per cent in excess of the requirements.

The excess production of carbon dioxide involves a fact of commercial importance, that is, it makes it possible for a factory to buy lime from outside sources up to the limit to which it has

the extra gas to carbonate it. From the figures given above, it may be calculated that a factory could buy about 20 per cent of its lime from outside sources and still have enough gas from its kilns for the carbonation. Further it is not difficult to increase the carbonation efficiency above 70 per cent if there is some incentive to do so, and any such increase of course, means that there is less gas wasted and consequently it is possible to increase still further the percentage of outside lime that can be used.

It is therefore not uncommon for a beet sugar factory to buy a portion of its lime from outside sources. This may be desirable because of lack of sufficient lime kiln equipment, or because of the saving of freight that can be made by shipping burnt lime instead of limestone from a quarry or manufacturing center.

The Steffen Process

At a limited number of beet sugar factories the sugar in the refuse molasses is extracted by a chemical process known as the Steffen Process. Lime ground to an impalpable powder is added to the dilute molasses solution at a low temperature in an apparatus known as a "cooler," which has means for mechanical refrigeration and for circulating the solution rapidly during the addition of the lime. An even and regular distribution of the lime into the molasses solution and the maintenance of a low temperature are the essential features for the economical operation of this process. The sugar unites with the lime under these conditions, forming insoluble calcium trisaccharate, which is filtered out by means of filter presses and is washed with cold water.

The "saccharate cake" from the filter presses is then mixed with water and added to the beet juice in the carbonation tanks in place of the milk of lime used at factories which are not equipped with the Steffen Process. The saccharate is decomposed by the carbon dioxide gas in the carbonation process, insoluble calcium carbonate being formed and the sugar going into solution. The lime in the saccharate has the same purifying action on the juice as when milk of lime is used, and it carries with it the additional sugar which has been extracted from the molasses in the Steffen Process.

The Steffen Process is quite widely

used in the United States; about one-third of the beet sugar factories are equipped with it. It might be added that beet molasses, unlike cane molasses, is not fit for human consumption. Such beet molasses as is not worked up in the Steffen Process is sold for cattle feeding or for the production of alcohol. The employment of lime for extracting the sugar from beet molasses therefore renders directly available for human consumption a considerable quantity of sugar which would otherwise be sold in the form of molasses for other purposes.

Quality of Lime Required for Beet Sugar Manufacture

The lime must in the first place be of as high purity as possible. Limestone of 96 to 98 per cent calcium carbonate is usually sought, if not always attainable. This will yield lime containing 93 to 96½ per cent calcium oxide. Magnesia is valueless for sugar-making purposes and cannot replace calcium oxide even in part.

The presence of silica is especially objectionable, because it unites with lime at the temperatures prevailing in lime kilns and causes "overburning," and a comparatively small amount of silica may render inactive a much larger amount of lime. Other impurities are objectionable mainly in proportion only to the actual quantity present.

The requirements of lime for the Steffen Process are particularly severe. As regards its physical condition, it must practically all pass a 200-mesh sieve. It must be low in moisture, preferably under one or one and a half per cent, because calcium hydrate (slacked lime) is valueless in the Steffen Process. High purity is of even more importance than in the case of lime for the regular process. Overburning is also more serious, because lime which is only slightly overburnt, will slack in time and can be used to make milk of lime for the ordinary process, but the use of such lime will be very uneconomical in the Steffen Process.

On the other hand lime which has been burnt at a low temperature, and is a soft, rapidly slacking lime, does not give good results in the Steffen Process. This the writer has found to be due to the fact that such lime, on account of its softness, grinds to too fine a powder in the mills; the result is the production of lime of a plastic nature, which tends to stick together and in extreme cases will even take the form of small pellets. Lime of this kind has the same effect as coarse lime, that is it cannot be distributed evenly into the molasses solution, and excessive quantities are required. The best lime for the Steffen Process is therefore burnt at an intermediate temperature, high enough to

overcome the condition just mentioned, and at the same time not high enough to cause a seriously overburnt condition.

Lime in the Cane Industry

Lime, in conjunction generally with sulphur dioxide gas, is the most important chemical used also in the manufacture of raw cane sugar and "plantation granulated" from the sugar cane. The amount used in proportion to the sugar is much smaller than in beet sugar manufacture, nevertheless the total quantity of lime used in this industry is important in the aggregate. As the lime consumption of a cane sugar mill is smaller than that of a beet sugar factory, and as carbon dioxide gas is not required in the process, the lime may be purchased where market conditions afford the cheapest supply of the proper quality. The raising of cane and the manufacture of cane sugar in the United States are almost entirely confined to the states of Louisiana and Texas.

At some cane sugar factories, particularly those in Java which aim to manufacture white sugar from the cane for direct consumption, a "carbonation process" involving the use of lime and carbon dioxide gas is employed which is very similar to the process used in beet sugar manufacture.

The third important branch of the sugar industry consists of the refining industry. At present the largest portion of granulated sugar which is consumed in this country still comes from the sugar refineries. These are located in a few of the large seaports and manufacturing centers on the Atlantic and Pacific coasts, and refine the raw cane sugar which is manufactured in tropical countries. The main sources of supply of the raw sugar refined in the United States are Cuba and Hawaii.

Lime is used also in the refining process. The general method of procedure is to mix the raw sugar with a small amount of low grade syrup and wash it in centrifugal machines. The washed sugar is then dissolved in water, or "melted," as it is called; the resulting liquor is treated with a small amount of milk of lime, and phosphoric acid is added for neutralization, an insoluble precipitate of calcium phosphate being formed, which carries down certain impurities and acts as a filtering medium much as in the case of the calcium carbonate precipitated in the carbonation process. The liquor is next filtered, generally through bag filters, and then passes to the well known boneblack treatment by which it is decolorized.

On account of the small amount of lime required, refineries commonly purchase their lime from a commercial dealer. Although the amount of lime used by a refinery is very small indeed in propor-

tion to the amount of sugar handled, the refineries themselves are plants of such large capacity, commonly "melting" from one million up to five or six million pounds of raw sugar a day, that the supplying of lime to a refinery is well worth consideration as a portion of a lime dealer's business.

The requirements of lime for cane sugar manufacturing and refining are the same as those for the ordinary process of beet sugar manufacture, that is it should be as pure as possible, and should not be overburnt.

Lime Cheapens Cost of Sugar Making

The processes of sugar manufacture, in which lime is the most important chemical used, have been brought to a high state of development. As scarce and high-priced as some people may think sugar has been during war times, it may be worth while for them to consider what we would have done if we had had no domestic production but had been forced to draw on foreign countries for our entire supply. Without the use of lime, which plays so important a part, we might have no domestic sugar industry, or at any rate the manufacturing process would be much more expensive and the final product considerably higher in cost.

Lime Association Comments On Sugar Industry

ADVANCE PROOF of the above article was furnished the general manager of the Lime Association and the weekly letter of the Association April 4 contains the following comment, in addition to quoting the statistics given in the first paragraph of the article, and an abstract of Mr. Osborn's description of the process of lime burning in the sugar industry. The Chemical Bureau of the Lime Association comments as follows:

"For the reasons stated above, and not having any information to the contrary, we believe that this tonnage of lime is not being reached at all by our members. It occurs to us that at every sugar-manufacturing plant fuel is burned for the purpose of making power, and it is a simple matter, under such conditions, to recover from the flue gases more than sufficient carbon dioxide for use in the sugar-making process.

"It seems to us, therefore, that this lime-making part of the sugar business must be an undesirable branch, in that it is not necessarily directly contributory to sugar production, but does require a considerable investment in quarries, kilns, and operating force.

"We believe that a campaign can be put on with the sugar companies that will be productive of good results."

Business Condition of Country Controlled By the Railroads

Freight Rates Paramount Factor in Situation Preventing Return of Prosperity, Protests Ben Stone to Railroad Administration

POINTING OUT THE PERNICIOUS effect the railroad administration's attitude on the freight rate matter is having on the business life of the country, Ben Stone, business director of the Illinois Sand and Gravel Producers' Association has written an argumentative protest to Edward Chambers, in charge of rate making at Washington, against the recent announcement that no reduction in rates will be made.

The letter follows:

Mr. Edward Chambers, Director,
Division of Traffic.

Statement issued by the Director General on March 20th, that no reductions will be made in freight rates on building materials except that reductions are being contemplated on rock, crushed stone, sand and gravel for public work, but that even these reductions will not be made until after it is certain that material men will make a reduction in prices, is disappointing, not only to the producers and manufacturers of materials involved, but to everyone concerned in their use.

Confining my remarks to sand and gravel, I would respectfully call your attention to the fact that rates now in effect were made for the purpose of discouraging production during war times, and in that respect they have had a most far reaching effect. Production in 1918 was less than half of normal and a number of the plants in Illinois operated at a loss on account of small production and heavy overhead.

Construction Held Up By Freight Rates

The construction program of the entire country is waiting for a reasonable basis of freight rates. From all parts of the country we have reports of extensive building and construction projects. In the state of Illinois alone, plans involving the expenditure of more than \$225,000,000.00 are being delayed. Virtually all of this work is held up because of high prices, and in spite of efforts that have been made by all concerned, including various departments of the federal government, to get it started.

Control of Situation by Railroads

Control of the entire situation is so

largely in the hands of the railroad administration that it is extremely difficult to understand the attitude that has been taken as regards freight rates.

In the production of our materials the greatest element of cost is labor. The railroad administration, with the approval of the President, has fixed a standard rate for common labor, with which all lines of industry must compete.

The distribution of our products is controlled almost entirely by freight

roads as well, if the prohibitive, wartime rates on building materials are maintained.

If the lack of demand continues, there will be no production; there will be no traffic of this nature for the railroads to handle, and likewise no revenues from such traffic. Are you not crippling, at least, the goose that lays the golden egg? I am sure you are fully aware of the desirable features of sand and gravel traffic as a revenue producer for the railroads during the spring and summer months, and I shall not attempt to elaborate on that. I only wish to point out to you as far as I can, the general effect of the present basis of rates, which has already made itself apparent.

Plants Running Intermittently

In normal times every sand and gravel pit in the state of Illinois would be running at full capacity with large orders ahead. A number of our plants which were started in March, in anticipation of the return of normal conditions, now report that they are running only two or three days a week and have no business to speak of ahead. In other words, they are living from day to day, and so far, most of them have operated at a loss. And this, in spite of the impression which seems to have gained credence in a great many quarters, that prices are on an unwarranted high level.

Unless we can obtain a basis of freight rates that will permit our materials to move freely, we cannot hope for anything other than a serious curtailment of production. Why not place our rates on a basis 25 per cent above what they were prior to June 25, 1918, when other commodities were increased 25 per cent and an increase of from 50 to 100 per cent was attached to rates on sand and gravel and kindred materials?

I wish to assure you that the question of freight rates is a very vital one right now to this industry, and would respectfully and earnestly urge that the proposed reduction be given favorable consideration.

Illinois Sand & Gravel Producers Ass'n.

BEN STONE,
Business Director.

Springfield, Ill., April 7, 1919.

Admits Present High Freight Rates Were Designed to Restrict Construction

IT IS ADMITTED in the Department of Labor that present construction costs are much higher than the prewar level. In part this is accounted for by freight rates on road materials established during the war to prevent the movement of these materials for work other than Government work. There is every reason to believe these rates will be revised at once. The effect of such revision will be favorable to reduced construction costs, but most authorities are agreed that prewar prices in this field will not be reestablished. The condition of our currency and the generally higher price levels throughout the world, so these authorities assert, will not permit a return to prewar prices, and for these reasons present construction prices are not as abnormal as the popular mind is prone to believe them.—Official statement of U. S. Department of Labor, issued March 25.

rates, and here again the railroad administration has full power.

Bad Effect of High Rates

We would respectfully ask you, Mr. Chambers, to consider the effect, not only on the sand and gravel industry but upon the entire industrial fabric of the country and the revenues of the rail-

Price Reductions on Building Materials Are Artificial

NEW YORK—Government, banking, manufacturing and distributing interests are merging their influences to bring about a quick revival of building construction, according to The Dow Service Daily Building Reports.

Federal pressure on building material price commodities resulted last week in a 55-cent drop in the price of Portland cement in this market. At the same time price readjustments in other building materials became effective, mainly in the supplemental lists. The one object of putting the price lower is to bring the market within the reach of the investor, but the change, being an artificial one, is not to be of long duration and is there to be accepted at once.

The Price of Cement

To help meet the increasing demand for new construction and to permit building work to get started at once, the building material dealers of New York decided the week, April 1 to 7, to give the customers the benefit of the price cut in Portland cement that was arranged with the Industrial Board at Washington. There was a drop of 15 cents a barrel in Portland cement and a change in the rebate price on empty bags. This latter factor does not affect the consumer, it being merely a book-keeping charge between the dealer and the manufacturer. The drop of interest to the consumer, therefore amounts to 15 cents, mill, which works out to a reduction of 55 cents a barrel, a price shrinkage that is held to be artificial, especially since manufacturing costs have not reached their high level and the potential demand is much greater than the present market indicates. One important manufacturer of cement, by way of illustration, sent orders to his plant on Saturday to push production to full capacity. The present price of Portland cement in this market therefore is \$3.25 a barrel, delivered, as against \$3.80 a week ago.

There is some disturbance of minor importance in the finishing hydrate lime department, but whatever fluctuation in price there may be, either upward or downward, will be nominal and will be made merely to conform to the present tendency in nearly every line to artificially deflect prices to the advantage of the prompt builder. Manufacturers freely state that the prices are put at the present levels because their mills are hungry for business. When the rush begins the law of supply and demand must operate. The fabricated steel market is fairly illustrative of this feature of the market.

Railway Agricultural Agents Endorse Use of Lime and Limestone

Memphis Meeting Considers Distribution of Material

MEMPHIS, Tenn., April 5—More than 150 railroad men, chiefly representatives from the industrial departments of lines North and South, East and West have been in conference at Hotel Chisca, this city Wednesday, April 2, the meeting concluding last evening. J. L. Edwards, of Washington, D. C., manager of the agricultural section, U. S. Railroad Administration presided. Two sessions a day were held and the discussions technical and on promotion lines and matters of policy were interesting.

The methods of getting results in the agricultural sections, questions of shipping, home building, farm improvement, fruit growing, marketing, live stock, pasturage and land improvement were gone over in detail. The matter of co-operation of local bodies was considered.

Mr. Edwards and other officials stated to ROCK PRODUCTS' correspondent that in the matter of improvement of lands east of the Mississippi and in other sections also, the use of limestone and potash fertilizers was generally favored by the attendance and in general discussion of this among other subjects specific endorsement was given.

L. P. Bellah, industrial agent of the Nashville, Chattanooga and St. Louis R. R. with headquarters at Nashville was interviewed by ROCK PRODUCTS' correspondent. He stated that his road and other southeastern railroads were doing all they could to boost the use of the product in question, first believing it worked wonders in soil improvements, furthermore their road is in the center of a great limestone district. He intimated that in territory widely removed from the section they traversed an earnest interest and demand was being shown for this product.

In the convention hall were distributed copies of the March 29th number of ROCK PRODUCTS the delegates evincing much interest in the various articles on lime and limestone.

The attendance roster showed:

J. L. Edwards, Washington, D. C., manager agricultural section, U. S. railroad administration.

W. W. Croxton, Atlanta, Ga. general passenger agent Atlanta, Birmingham & Atlantic Railroad.

C. L. Seagraves Chicago Ill. supervisor of agriculture Atchison Topeka & Santa Fe Railroad.

J. F. Jarrell Washington D. C. supervisor of the homeseekers' bureau U. S. railroad administration.

F. C. McCabe St. Paul Minn. industrial agent, Chicago, St. Paul, Minneapolis & Omaha Railroad.

Douglas White, Los Angeles, Cal., supervisor of agriculture, Los Angeles & Salt Lake Railroad.

J. B. Lamson, Chicago, Ill., agricultural agent, Chicago, Burlington & Quincy Railroad.

J. C. Williams, Washington, D. C., manager of the agricultural development service, Southern Railroad.

F. S. Welsh, New York, agriculturist, New York Central Railroad.

L. J. Brickler, St. Paul, Minn. general industrial agent, Northern Pacific Railroad.

G. A. Park, Louisville, Ky., general industrial agent, Louisville & Nashville Railroad.

Donald Rose, Chicago, Ill., general development agent, Illinois Central Railroad.

W. L. English, St. Louis, Mo., supervisor of agriculture, St. Louis & San Francisco Railroad.

I. L. Peil, St. Paul, Minn., advertising agent, Northern Pacific Railroad.

H. J. Schwitter, Chicago, Ill., assistant general development agent, Illinois Central Railroad.

A. Jackson, Chicago, Ill., agricultural agent, Chicago Rock Island & Quincy Railroad.

R. A. Smith, Omaha, Neb., supervisor of agriculture, Union Pacific Railroad.

D. C. Boy, Johnson City, Tenn., manager of development service, Carolina, Clinchfield & Ohio Railroad.

C. L. Hoffman, New York, milk agent, New York, Ontario & Western Railroad.

O. H. Liebers, Denver, Colo., agricultural agent, Chicago, Burlington & Quincy Railroad.

S. B. Howard, Omaha, Neb., agricultural agent, Chicago, Burlington & Quincy Railroad.

W. L. Henderson, Mobile, Ala., agricultural and industrial agent, Mobile & Ohio Railroad.

E. C. Leedy, St. Paul, Minn., supervisor of agriculture, Great Northern Railroad.

E. L. Robinson, St. Louis, Mo., market and live stock agent, Mobile & Ohio Railroad.

H. C. McLendon, St. Augustine, Fla., manager of agricultural development Florida & East Coast Railroad.

T. Gilbert Wood, Roanoke, Va., agricultural agent, Norfolk & Western Railroad.

P. H. Burnett, New York, agriculturist, Lehigh Valley Railroad.

W. J. Curtis, Topeka, Kan., agricultural agent, Atchison, Topeka & Santa Fe Railroad.

G. A. Cardwell, Wilmington, N. C., agricultural and industrial agent, Atlantic Coast Line Railroad.

Walter S. Ayres, Chicago, Ill., industrial commissioner, New Orleans & Great Northern Railroad.

E. B. O'Kelley, Jacksonville, Fla., agricultural and industrial agent, Atlantic Coast Line Railroad.

H. B. Fullerton, Medford, N. Y., supervisor of agriculture, Long Island Railroad.

Geo. E. Bates, Albany, N. Y., real estate and industrial agent, Delaware & Hudson Railroad.

C. B. Kealhofer, Atlanta, Ga., traffic manager, Atlanta, Birmingham & Atlantic Railroad.

Jas. A. Jeffery, Duluth, Minn., land commissioner, South Shore & Atlantic Railroad.

E. D. Hotchkiss, Richmond, Va., freight traffic manager, Chesapeake & Ohio Railroad.

H. S. Funston, Minneapolis, Minn., supervisor of agriculture, Minneapolis, St. Paul & Sault Sainte Marie Railroad.

W. D. May, Memphis, division freight agent, Missouri Pacific Railroad.

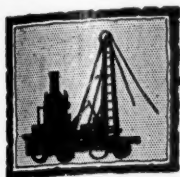
J. J. Taylor, Gulfport, Miss., industrial and immigration agent, Gulf & Ship Island Railroad.

J. A. Evans, Washington, D. C., assistant chief states relation service, U. S. Department of Agriculture.

J. O. Schaub, Washington, D. C., agriculturist and field agent, U. S. Department of Agriculture.

W. J. Williams, Norfolk, Va., traffic agent, Norfolk & Western Railroad.

Andrew Kimball, Tucson, Ariz., agricultural agent, Arizona Eastern Railroad.



NEW MACHINERY EQUIPMENT



Fuel Savers in Wet-Process Cement Plants

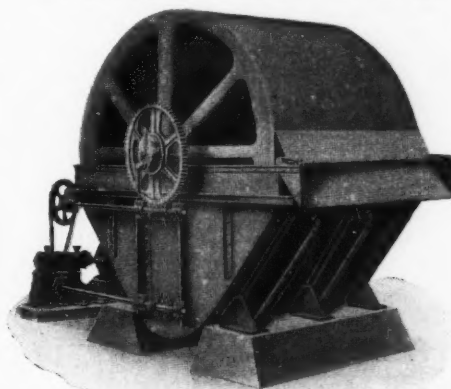
THE POSSIBILITY of a very large fuel saving, which will remove one of the chief arguments of those who oppose the wet process of cement manufacture, is coming to the fore in the use of vacuum continuous filters for partially dewatering the slurry before it is fed to the kilns.

The Oliver Continuous Filter Co., San Francisco, Calif., informs Rock Products that one of its 12-ft. diameter by 20-ft. face filters is now in operation at an Eastern cement plant. This filter is dewatering wet slurry from the tube mills before it is fed to the kilns, and it reduces the moisture content of the slurry from an average of somewhat more than 50 per cent to slightly under 30 per cent, thereby effecting a tremendous saving in the amount of water to be evaporated in the kilns, and also, it is

claimed, increasing the capacity and efficiency of the tube mills.

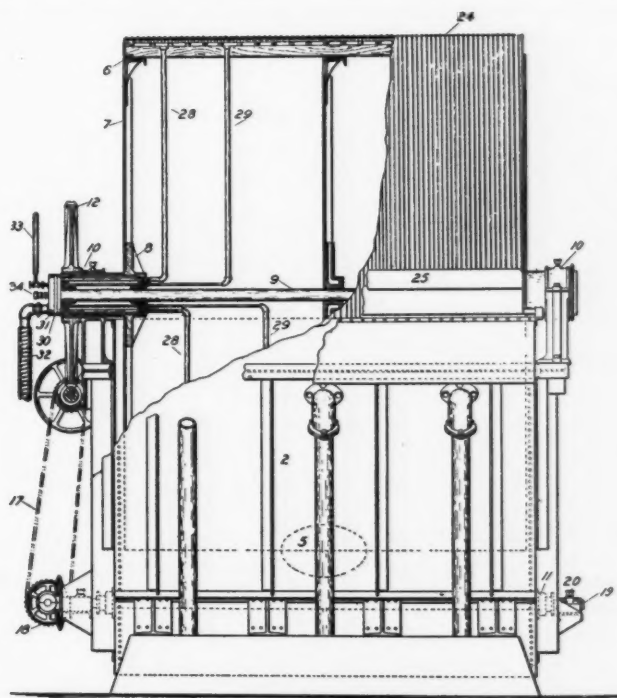
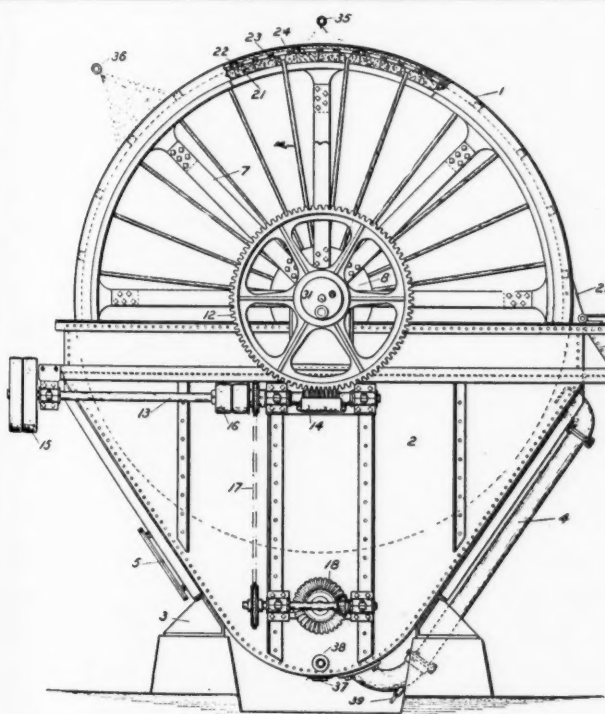
The Oliver filter is illustrated in the accompanying view and drawings. It is a well known piece of mine-plant equipment; and during the war a variety of new ones for it were developed.

The principal features of the device



are given in the accompanying drawings. It is composed of a drum surfaced with filter material (like burlap or canvas), which rotates slowly through a trough containing the material to be dewatered. The surface of the drum is divided into panels or sections which are independent units. As each section is submerged in the trough automatic air valves open and by a system of air pipes with openings on the surface of the drum a vacuum is created and a continuous layer or cake of the material is lifted from the trough and clings to the drum, until it is loosened by compressed air and scraped off on the opposite side of the drum.

A similar filter is the Portland continuous filter made by the Colorado Iron Works Co., Denver, Colo. An illustration of the use of these filters is shown on page 34 of this issue describing the American Limestone Co. plant.



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|-------------------------------|-------------------------------|
| 1. Filter Drum | 12. Worm Drive Gear |
| 2. Steel Filter Tank | 13. Worm Shaft |
| 3. Cast Iron Tank Supports | 14. Oil Well for Worm |
| 4. Air Lift Circulators | 15. Filter Drive Pulleys |
| 5. Manhole | 16. Pulleys for Wiring and |
| 6. Channel Steel Drum Rim | Agitator Drive |
| 7. Channel Steel Drum Arms | 17. Chain for Agitator Drive |
| 8. Hollow Cast Iron Trunnions | 18. Bevel Gear Agitator Drive |
| 9. Steel Drum Shaft | 19. Agitator Shaft—Rear End |
| 10. Main Bearings | 20. Agitator Shaft Bearing |
| 11. Agitator Stuffing Boxes | 21. Wood Staves for Drum |

- | | |
|-----------------------------|-------------------------|
| 22. Section Division Strips | 31. Automatic Valve |
| 23. Filter Medium | 32. Vacuum Hose |
| 24. Wire Winding | 33. Compressed Air Hose |
| 25. Steel Scraper | 34. Valve Stem |
| 26. Scraper Adjuster | 35. Wash Water Pipe* |
| 27. Tailing Apron | 36. Wash Solution Pipe* |
| 28. Vacuum Pipes | 37. Drain Flange |
| 29. Compressed Air Pipes | 38. Emergency Air Pipe |
| 30. Removable Valve Seat | 39. Air Lift Nozzles |

*Parts 35 and 36 are used only on filters used for recovering valuable solutions. Not used on dewatering filters.

General News From the Rock Products Markets

Basic Prices Held Up By Railway Fight on Steel

WASHINGTON, D. C.—As a result of the controversy which now rages between the Railroad Administration and the industrial board, it is possible that no effort will be made to announce the basic prices for cement and other commodities. These prices were arranged some days ago, publication of them having been deferred until the steel schedules were adopted, it being the purpose of the board to announce all prices at one time.

The members of the President's cabinet, the heads of other Government bureaus and the members of the board have been in conference almost daily in an effort to arrive at some meeting point on the steel schedule. The Railroad Administration, however, is obdurate in its contention that the steel prices are too high, citing as evidence the fact that it is still receiving deliveries on contracts made at prices ranging as much as \$10 a ton under those agreed upon by the board.

It was declared that it was not the intention of the board to indorse prices for the public, but that the acceptance of new prices by the Government was to be the assurance of the public that they were considered fair on the basis of known costs. Prices on cement, lumber, glass and other commodities have been determined, no opposition being offered in any of those industries.

A new angle has been injected into the situation by the charges of the coal industry that the Railroad Administration was decidedly unfair in its purchases of coal. It is charged by the coal men that the purchasing policy of the administration was such as to render abortive any attempts to settle prices, as the administration insisted that its purchases be made at a very low price, even though it was necessary, as a result, to increase prices to other consumers in order for the coal producers to come out even.

Secretary of Commerce Redfield is known to be diametrically opposed to the stand taken by the Railroad Administration, and has several times evinced his disapproval of its methods of conducting business.

The Railroad Administration, it would appear, has long been a drawback to any efforts to stabilize conditions. It has been the consistent policy of the administration that the railroads under Federal control should show a profit, no matter who else suffers, as a result of which a number of the Atlantic coast-

wise steamship companies have been almost ruined, while patrons of the roads, as in the case of the Solvay Process Co., have been forced to pay three or four times as high a rate on raw materials as formerly applied.

It is probable that, shortly after the extra session convenes, the question of the railroad administration's policy will be brought up in Congress for discussion.

Michigan Carries Fifty Million Dollar Bond Issue

THE VOTERS of Michigan endorsed the proposed state bond issue for \$50,000,000 by a big majority at the election held April 7.

Attempt to Fix Prices of Mineral Aggregates Abandoned

ANNOUNCEMENT was made by the Industrial Board of the Department of Commerce (Secretary Redfield's price-fixing committee) on April 9 that: "In relation to sand, gravel, and crushed stone, the Industrial Board announces that owing to the large number of firms and individuals engaged in the business, and the local character of their operations, competitive conditions within the industry are so definite and so persistent that nothing more can be done by the board than to recommend a continuation of the practice of competitive bidding in governmental purchases."

Memphis Issues \$750,000 in Bonds for Buildings

MEMPHIS, TENN.—The \$750,000 bond issue for the Memphis city auditorium and municipal market in lots of \$375,000 by the county and city was awarded to the Guaranty Bank and Trust Co. and the Commercial Trust and Savings Bank of Memphis. Work will probably begin in the next few months. Local architects have been making plans.

State Competition with Convict Labor Ruins Business

COMPETITION OF THE STATE penitentiary authorities with convict labor caused the Beaver Portland Cement Co., Portland, Ore., to cease operating its agricultural limestone plant. The state sold the product to farmers at cost of production.

U. S. Cement Exports For Part of Fiscal Year

WASHINGTON, D. C.—The tide is just beginning to turn in our foreign trade in cement, according to statistics now being compiled by the Department of Commerce, and, although the records show our shipments to be lower in quantity than for two years, the higher prices which prevail have kept the trade from dropping as far as otherwise would have been the case.

During the month of February our exports of hydraulic cement amounted to 170,823 barrels, as compared with 224,993 in February, 1918, but the higher market increased the value of our exports from \$483,531 (February, 1918) to \$516,472 (February, 1919).

For the first eight months of the current fiscal year our exports of cement totaled 1,310,302 barrels, valued at \$3,891,542, as compared with 1,817,968 barrels, with a value of \$4,022,570, in 1919, and \$1,510,788 barrels, worth \$2,436,824, in 1917.

The following table will show how our foreign trade has fluctuated during the period of the war:

PANAMA		
Year	Barrels	Amount
1917	224,760	\$ 330,244
1918	211,826	412,838
1919	139,786	353,607
MEXICO		
1917	58,606	124,386
1918	70,890	187,867
1919	76,440	243,043
CUBA		
1917	455,131	747,023
1918	583,378	1,328,943
1919	253,772	752,828
ARGENTINA		
1919*	171,359	494,257
BRAZIL		
1917	212,436	309,408
1918	339,965	743,731
1919	135,713	381,101
PERU		
1917	63,025	106,106
1918	45,451	97,620
1919	75,202	234,035
OTHER COUNTRIES		
1917	496,830	849,667
1918	566,458	1,251,571
1919	458,030	1,432,671

*No hydraulic cement was exported to Argentina in 1917 or 1918.

Testing for Soundness of Lime Plaster

THE UNITED STATES BUREAU of Standards, under the direction of Warren E. Emley, working in conjunction with the Advisory Committee of the Lime Association appointed upon request of the Bureau of Standards, has outlined a comprehensive program for determining all of the factors that have any bearing on producing pitting and popping in lime plasters. The Bureau of Standards is starting on this program immediately and will develop results as rapidly as possible.

General News From the Rock Products Markets

Alsatian Potash Prices to Be Under Pre-War German Prices

ACCORDING to information furnished by the U. S. Bureau of Mines, Alsatian potash salt prices have been fixed, and announced by the French Minister of Agriculture. These prices are very low in view of the general rise of prices in France since the war began. Shipments at these prices will be made only in carload lots. Orders will be filed with the Central Office of Agricultural Chemical Products, 42 Rue de Bourgogne, Paris, which will transmit them to the recently organized Bureau of Sales, at Mulhausen. (Journal Official, Jan. 5, 1919). These prices as compared with the German syndicate prices before the war, are as follows:

	Per cent K ₂ O	German syndicate's list prices f.o.b. Mines per net ton 1913-1914	French prices per net ton Jan. 5, 1919	German pre-war prices per unit Cents	Present French prices per unit Cents
Kainite	12.5	\$ 4.76	\$ 4.51	38	36
Muriate	50.0	32.10	32.83	64.2	65.6
Manure salts.....	21.1	10.51	9.80	49.8	46.4

It is evident that with present American-made potash quoted at about \$3.50 per unit the prospect of the industry in America is rather uncertain.

Revised Order on Refused Freight Shipments

WASHINGTON, D. C.—New regulations for the disposition, by railroads under Federal control, of freight shipments which have been refused or are unclaimed at destination by consignees, after having been on hand for 60 days, have just been issued by Walker D. Hines, Director General of Railroads. The new orders provide for the sale of such shipments at public auction to the highest bidder, without advertisement.

The present regulations, providing for the notification of the consignee of the arrival of shipments, will continue in force, but the notices to be sent out hereafter will direct attention to the fact that after freight is unclaimed or undelivered for fifteen days after the expiration of the free time at destination, it will be treated as refused and will be sold without further notice sixty days from the date of notice of arrival.

Where the waybilling shows the name and address of the consignor, or same can be ascertained from the markings on the shipment, he will be notified of refused or unclaimed shipments, as heretofore, with notice that unless proper instructions for disposition are received on or before a certain date not earlier than 60 days from the date of arrival and no-

tice to the consignee, the shipment will be sold for charges without further notice.

Federal Home Loan Banks Proposed in New Law to Help Building

WASHINGTON, D. C.—The next Congress will be asked to enact legislation necessary to the establishment of a system of Federal Home Loan Banks. A tentative bill has been prepared and has been mailed to all officers and committees of the U. S. League of Building Associations and copies can be obtained from the Division of Public Works and Construction Developments of the U. S. Department of Labor.

The U. S. Department of Labor and the U. S. League of Building Associa-

tions at a conference in Washington favored a national system of Home Loan Banks through which these associations might rediscount their securities and make available for further loans a greater portion of their assets.

Association representatives suggested that Congress enact a law permitting these associations to organize regional banks, capitalized by the associations and operated by them under government supervision. The purpose of this was to provide a regional bank which would perform for building associations a service similar to that performed by the Federal Reserve Bank for the commercial banks, and by the Federal Land Bank for the National Farm Loan Association.

New Plaster Representative of Lime Association in Eastern Territory

LIEUT. E. M. SANBORN has just returned from France and will receive his charge within the next two weeks. Mr. Sanborn will shortly thereafter join the staff of the Construction Bureau of the Lime Association as Eastern plaster representative. Many manufacturers will remember Mr. Sanborn as the plaster representative of the former Hydrated Lime Bureau. He will work among architects in Washington, Baltimore, Philadelphia, New York and New England points.

California May Spend Over \$100,000,000 on Roads

OAKLAND, CALIF.—The legislature of California will undoubtedly submit a new state highway bond issue of \$40,000,000 to a vote of the people. The urgent appeal for more roads and the well-balanced program submitted by the committee from all sections of the state indicates that such a bond issue will carry by a tremendous vote.

Adding this \$40,000,000 to the \$18,000,000 and \$15,000,000 bond issues previously voted will bring the total to \$73,000,000. By the time this new \$40,000,000 shall have been expended, the total expenditures of all the counties on their local roads will have achieved almost as large a sum. To this total must be added many millions which the federal government will expend in California on a fifty-fifty basis.

According to the Good Roads Bureau of the California State Automobile Association, at least 10 counties of northern California are either now engaged in good roads campaigns or are energetically preparing plans to issue bonds for the construction of local highway systems.

American Concrete Pipe Association in Big Plans

AMERICAN CONCRETE PIPE Association has been reorganized. The association is to move forward on a much broader plane and is to be supported by an assessment of approximately one cent per ton of pipe delivered in 1918. The association plans in a short time to open an office with executive officers in charge to further the educational work which is now so well started. G. E. Warren, 210 So. La Salle St., Chicago, is secretary.

A bulletin is to be issued periodically. Greater support has been voted for the technical committees studying concrete sewer pipe, drain tile and culvert pipe, and series of tests have been outlined on further study of reinforcement for culvert pipe. Work of the Joint Committee on Culvert Pipe, representing all of the national engineering societies and associations, is to have the support financially of the Pipe Association if needed.

There are approximately 400 manufacturers of concrete drain tile and sewer pipe in the United States and Canada. The plan includes taking in members of the Pacific Concrete Pipe Association and the Northwest Concrete Pipe Association.

The Rock Products Market



Agricultural Limestone Wholesale at Plant, per Ton

EASTERN:

Danbury, Conn.—(50% thru 100) Analysis, CaCO ₃ , 90%; MgCO ₃ , 5%; ppr., \$4.50; bulk.....	2.75
Gasport, N. Y.—Analysis, CaCO ₃ , 97%—50% thru 100 mesh.....	2.00
Hillsville, Pa.—Analysis, CaCO ₃ , 85%; MgCO ₃ , 1½%—(70% thru 100 mesh) in 80 lb. ppr. bags, \$4.50; bulk.....	3.00
Pownal, Vt.—(50% thru 100) Analysis, CaCO ₃ , 90%; MgCO ₃ , 5%; ppr., \$4.50; bulk.....	2.75
Syracuse, N. Y.—Analysis, CaCO ₃ , 91.50%; MgCO ₃ , 3.16%—(100% thru 20 mesh; 95% thru 50; 68% thru 100); sacks, 3.75; bulk.....	2.25
Walford, Pa.—(70% thru 100 mesh; 90% thru 50 mesh; 50% thru 50 mesh; 100% thru 10 mesh; 50% thru 4 mesh), paper sacked.....	4.50
Bulk.....	3.00
West Stockbridge, Mass.—(50% thru 100) Analysis, CaCO ₃ , 90%; MgCO ₃ , 5%; ppr., \$4.50; bulk.....	2.75

CENTRAL:

Alton, Ill.—(Pulv. and 90% thru 50 mesh; 90% thru 4 mesh) Analysis, CaCO ₃ , 96%; MgCO ₃ , 75%.....	2.00
Bedford, Ind.—(90% thru 10 mesh) Analysis, CaCO ₃ , 98.5%; MgCO ₃ , 0.5%.....	1.75
Canton, O.—100% thru 10 mesh; 49% thru 100; 59% thru 50.....	3.00
Columbia, Ill., near East St. Louis —(¾" down).....	1.25@1.80
Elmhurst, Ill.—(Analysis, CaCO ₃ , 35.73%; MgCO ₃ , 20.69%) ¾ in. to dust.....	1.00@1.25
Greencastle, Ind.—(50% thru 50 mesh) Analysis, CaCO ₃ , 98%.....	1.75
Lannon, Wis.—(90% thru 50 mesh) Analysis, 54%, CaCO ₃ ; 44%, MgCO ₃	2.50
Marble Cliff, O.—(50% thru 100 mesh) Analysis, CaCO ₃ , 86%; MgCO ₃ , 8%.....	3.00
McCook, Ill.—(100% thru ¼" sieve; 78.12% thru No. 10; 53.29% thru No. 20; 38.14% thru No. 30; 26.04% thru No. 50; 16.27% thru No. 100) Analysis, CaCO ₃ , 54.10%; MgCO ₃ , 45.04%.....	1.00
Milltown, Ind.—Analysis, CaCO ₃ , 98%.....	1.50
Montrose, Ia.—(90% thru 100 mesh).....	1.25@1.35
Muskegon, Mich.—(90% thru 50 mesh) Analysis, CaCO ₃ , 53.35%; MgCO ₃ , 43.27%.....	2.50
Piqua, O.—(50% thru 100 mesh).....	2.50@4.00
Rockford, Ill.—Analysis, CaCO ₃ , 53.75%; MgCO ₃ , 44.35%.....	1.25
Stolle, Ill. (near East St. Louis on I. C. R. R.)—(Thru ¾" mesh) Analysis, CaCO ₃ , 89.61 to 89.91%; MgCO ₃ , 3.82%.....	1.50
Stone City, Ia.—(50% thru 100 mesh).....	.50
Toledo, O.—Analysis, CaCO ₃ , 52.72%; MgCO ₃ , 43%—(20% thru 100 mesh; 30% thru 50; 80% thru 100; 100% thru 5/32 screen).....	1.80
Whitehill, Ill.—Analysis, CaCO ₃ , 96.12%; MgCO ₃ , 2.50%—50% thru 100 mesh, bulk.....	1.50

SOUTHERN:

Cartersville, Ga.—All thru 100 mesh.....	3.00
Dittlinger, Tex.—Analysis, CaCO ₃ , 99.09%; MgCO ₃ , 40%.....	2.00
90% thru 100 mesh.....	1.00
90% thru 4 mesh.....	1.00
Fletcher, N. C.—Analysis, CaCO ₃ , 75%; MgCO ₃ , 22%—(all thru 10 mesh; 50% thru 100 mesh)—100 lb. paper or 200 lb. burlap, \$3.60; bulk.....	2.10
Grovania, Ga.—Analysis, CaCO ₃ , 95%; MgCO ₃ , none—50% thru 100 mesh.....	2.50@3.00

(Continued on next page.)

Wholesale Prices of Crushed Stone

Prices given are per ton, F. O. B., at producing plant or nearest shipping point

Crushed Limestone

City or shipping point	Screenings, ¼ inch down	¾ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
EASTERN:						
Auburn and Syracuse, N. Y.....	.80	1.20	1.20	1.20	1.20	1.20
Buffalo, N. Y.....		1.25, all sizes from stock piles.				
Coldwater, nr. Rochester, N. Y.....		Flux, 1.50@2.10				
Grove, Md.....	1.50	2.25	2.10	1.90	1.50 (local)	1.35
North Leroy and Akron, N. Y.....	\$1.00 for all sizes, including R. R. ballast					
Walford, Pa.....	1.50	1.50	1.50	1.40	1.40	1.40
CENTRAL:						
Alden, Ia.....	.40		1.00	1.00	1.00	1.00
Alton, Ill.....	1.85		1.45	1.35		
Belvidere, Ill.....		1.00 for any size produced				
Bettendorf, Ia.....		1.35@1.50	1.35@1.50	1.35@1.50		
Columbia, Ill. (near E. St. L.).....	1.25@1.80	.85@1.20	.95@1.30	.95@1.30	.80@1.20 (2300 lbs.)	
Detroit, Mich.....		Various sizes \$1.50 per net ton				
Dundas, Ont.....	.60	1.05	1.05	1.05	.85	.85
Eden and Knowles, Wis.....		.80		1.00	1.00	
Elmhurst, Ill.....		80 for all sizes				
Greencastle, Ind.....	.90@1.25	1.10	1.00	.90	.90	.90
Illinois, Southern.....	1.50	1.25	1.25	1.25	1.25	1.00
Kokomo, Ind.....						
Lannon, Wis.....						
Lewisburg, O.....	80@1.00		1.00@1.10	1.00	1.00	1.00
Lima, O.....			1.10 for any size			
Linwood, Ia.....	.60	1.05	1.00	.91	.91	1.00
Mankato, Minn.....				1.50	1.25	
Mayville, Wis.....	.75	1.00@1.35	1.00	1.00	1.00	1.00
McCook, Ill.....	1.00	1.60	1.00	.80	.80	.70@.80
Montrose, Ia.....		1.10@1.15	1.10@1.15	1.00@1.10	1.00@1.10	
Oshkosh, Wis.....		1.00 in all sizes, Blue Limestone				
River Rouge, Mich.....	.80@1.00	1.15	1.15	1.15	1.15	1.15
Rockford, Ill.....	1.25			1.25	1.25	1.25
Sheboygan, Wis.....			1.00 for all sizes			
Sherman and Hamilton, Wis.....			All sizes \$1.00 per ton			
Stone City, Ia.....		.50	(1-inch 1.20)	1.10	1.00	
Toledo, Ohio.....	1.60	1.80	1.80	1.80	1.70	1.70
Toronto, Can.....	1.55	1.95	1.95	1.95	1.75	1.75
SOUTHERN:						
Brookville, Fla.....	.50			2.50		
Cartersville, Ga.....		1.85	1.75	1.65		1.55
Fort Springs, W. Va.....	.75	1.00	2.00	1.50	1.40	
Linnville Falls, N. C.....						
WESTERN:						
Mascot, Tenn.....	1.00@1.25					
Memphis Junction, Ky.....						
Winnfield, La.....	.60		1.60	1.60	1.60	
Crushed Trap Rock						
City or shipping point	Screenings, ¼ inch down	¾ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
Birdsboro, Pa.—Trap.....	2.00	1.80	1.70	1.50	1.50	1.25
Branchford, Conn.—Trap.....	.80	1.25	1.25	1.20	1.10	
Dresser Jct., Wis.....	.50	1.25	1.25	1.10	1.00	.95
Duluth, Minn.—Trap.....	.75	1.40@1.50		1.10@1.35	1.10@1.15	
Farmington, Conn.—Trap.....	.80	.95	.95	.90		
Glen Mills and Rock Hill, Pa.—Trap.....	1.20	1.40	1.60	1.50	1.40	1.40
Little Rock, Ark.—Trap.....		1.75		1.75	1.50	1.35a
Millington, N. J.—Trap.....	1.80	2.00	1.80	1.60		
Montrose, Ia.—Trap.....		1.10@1.20	1.10@1.25	1.05@1.10	1.00@1.10	
Morristown, N. J.—Trap.....	1.85	1.75	1.75	1.60	1.40	1.40
New Britain, Conn.—Trap.....	.80	1.40	1.35	1.30	1.10	
Richmond, Cal.—Trap.....	.50*	1.40*	1.40*	1.30*		
Westfield, Mass.—Trap.....	.60	1.00	1.10	1.00	.90	

Crushed Trap Rock

City or shipping point	Screenings, ¼ inch down	¾ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
Brookville, Fla.—Flint.....	1.00			2.50		
Fair Oaks, Calif.—Cr. Bldrs.....	.85	1.05	.95	.85	.85	
Hendlers, Pa.—Quartzite.....	.80	1.00	1.25	1.00	1.00	1.00
Little Falls, N. Y.—Syenite.....	.80	1.20	1.40	1.20	1.20	1.20
Middlebrook, Mo.—Granite.....					2.00	1.00
Richmond, Va. (Quarry).....	1.00@1.75	1.40@1.75	1.40@1.75	1.40@1.75	1.40@1.75	1.40
So. Richmond, Va.—Granite.....	1.00@1.25	1.25@1.75	1.40@1.75	1.40@1.75	1.40@1.50	1.40@1.50
Stockbridge, Ga.—Granite.....	.50	2.00	2.00	1.90	1.85	1.75

Miscellaneous Crushed Stone

City or shipping point	Screenings, ¼ inch down	¾ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
Brookville, Fla.—Flint.....	1.00			2.50		
Fair Oaks, Calif.—Cr. Bldrs.....	.85	1.05	.95	.85	.85	
Hendlers, Pa.—Quartzite.....	.80	1.00	1.25	1.00	1.00	1.00
Little Falls, N. Y.—Syenite.....	.80	1.20	1.40	1.20	1.20	1.20
Middlebrook, Mo.—Granite.....					2.00	1.00
Richmond, Va. (Quarry).....	1.00@1.75	1.40@1.75	1.40@1.75	1.40@1.75	1.40@1.75	1.40
So. Richmond, Va.—Granite.....	1.00@1.25	1.25@1.75	1.40@1.75	1.40@1.75	1.40@1.50	1.40@1.50
Stockbridge, Ga.—Granite.....	.50	2.00	2.00	1.90	1.85	1.75

*Cubic yard. †Agrl. lime. ||R. R. ballast. §Flux. ‡Riprap. a 3-inch and less.

Agricultural Limestone Wholesale at Plant, per Ton

(Continued from preceding page.)

Memphis Jct., Ky.—(Analysis, CaCO ₃ , 95.31%; MgCO ₃ , 1.12%) average price	2.00
Keystone, Ala.—(90% thru 50 mesh) Analysis, CaCO ₃ , 99.50%; MgCO ₃ , none	1.25
Mascot, Tenn.—Analysis, CaCO ₃ , 52%; MgCO ₃ , 38% (90% thru 100 mesh).....	2.50
(80% thru 200 mesh).....	3.50
(All thru 10 mesh).....	1.75
Paper bags, \$1.50 extra per ton; burlap, \$2.50 extra per ton.	
Winnfield, La.—(50% thru 50 mesh).....	4.50
WESTERN:	
Cement, Cal.—Analysis, CaCO ₃ , 95%; MgCO ₃ , 1% (50% thru 100 mesh).....	4.00@5.00
Kansas City, Mo.—(50% thru 50 mesh).....	1.50

Miscellaneous Sands per Ton at Plant

Silica sand is quoted washed, dried and screened, unless otherwise stated.

GLASS SAND:	
Bowmanstown, Pa.—Glass sand.....	2.50
Cedarville, N. J.—Glass.....	2.50@4.00
Gray Summit, Mo.—Glass.....	2.00@2.50
Hancock, Md.—Engine and glass.....	2.50
Mapleton, Pa.—Glass, dry.....	2.75@3.00
Massillon, Ohio—Glass.....	2.00
Michigan City, Ind.—Glass sand.....	.30
Millington, Ill.—Glass.....	1.75@2.00
Mineral Ridge, O.—Glass.....	2.10@3.00
Montoursville, Pa.—Glass, green, washed.....	2.00@2.75
Montreal, Can.—Glass.....	4.00
Ottawa, Ill.—Glass:	
Large contracts.....	1.75
All others.....	2.00@2.25
Sands, Elk Co., Pa.—Glass sand:	
Selected, green.....	2.50
Silica and Pacific, Mo.—Glass.....	2.00@2.50
St. Mary's, Pa.—Glass sand—Green.....	2.50
Sugar Grove, Ohio—Glass.....	2.00@2.25
Thayers, W. Va.—Glass.....	2.50@3.00

FOUNDRY SAND:

Albany District, N. Y.—Molding.....	1.75
Allentown, Pa.—Core.....	1.40@1.50
Bowmanstown, Pa.—Core.....	1.20
Molding, fine and coarse.....	1.50
Roofing pebble, washed.....	5.00
Cleveland, O.—Core, at pit.....	1.00@1.25
Cleveland, O.—Molding, delivered.....	2.70@2.95
Brass molding, delivered.....	2.95
Columbus, O.—Molding.....	1.50@2.00
Delaware, N. J.—Molding.....	1.50@2.00
Franklin, Pa.—Brass molding.....	1.65
Molding (gray iron).....	1.50
Gray Summit, Mo.—Molding.....	1.50@2.50
Kansas City, Mo.—Core.....	1.00
Klondike and Pacific, Mo.—Molding.....	1.50@2.50
Hellam, Pa.—Molding.....	2.00
Mapleton, Pa.—Molding, fine and core, damp.....	2.50
Molding, fine, dry.....	3.00
Massillon, O.—Steel molding.....	2.50@3.50
Millington, Ill.—Core, furnace lining, damp.....	1.50
Roofing and stone sawing.....	2.00
Montoursville, Pa.—Core, molding fine, traction.....	1.25@2.00
Brass molding.....	1.50@2.25
Montreal, Can.—Molding.....	2.75@3.25
Michigan City, Ind.—Core.....	.30@.40
Ohio—Various points:	
Fine molding.....	2.00@2.25
Coarse molding.....	1.75@2.00
Ottawa, Ill.—Core, Steel Molding.....	2.00
Ottawa, Ill.—Furnace Lining.....	.70
Ottawa, Ill.—Sand blast sand.....	2.20@2.75
Ottawa, Ill.—Sawing sand.....	1.25@1.75
Ottawa and Utica, Ill.—Molding.....	.75@1.25
Thayers, Pa.—Core and traction.....	2.00
Wedron, Ill.—Molding.....	.75@1.00
Thayers, Pa.—Molding, fine.....	1.00@1.25
Molding, coarse, furnace lining.....	1.00
West Albany, N. Y.—Molding.....	1.50@2.00

Wholesale Prices of Sand and Gravel

Prices given are per ton, F. O. B., at producing plant or nearest shipping point

Washed Sand and Gravel

City or shipping point	Fine Sand, 1/10 inch down	Sand, 1/4 inch and less	Gravel, 1/2 inch and less	Gravel, 1 inch and less	Gravel, 1 1/2 inch and less	Gravel, 2 inch and less
EASTERN:						
Boston, Mass. (wharves).....	1.25	1.00	2.50	1.75	1.65	1.50
Buffalo, N. Y. ....	.80	.80	.75	.75	.75	.75
Buffalo, N. Y. (Niagara River).....	.85	.80	.80	.75	.75	.75
Libby's Pit, Leed's Junct., Me.	1.00@1.15	.50@.75	1.50	1.45	1.35	1.25
Morristown, N. J. ....	.60	.60	1.20	1.00	1.00	1.00
North Wilbraham, Mass. ....		.60*	2.00*		1.25*	
Philadelphia, Pa. ....		.95		1.40		1.25
Pittsburgh, Pa.		1.25		1.25	1.05	1.05
Shaw's Land'g, Meadville, Pa.		1.00				1.00
Washington, D. C.—Wharves.....	.75	.75	2.00	1.40	1.20	1.20
CENTRAL:						
Barton, Wis. ....	.75	.70	1.00	.70	.70	.70
Beloit, Wis. ....		.60			.60	
Cherokee & Rock Valley, Ia. ....		.40				.90
Chicago, Ill.	1.35@1.45	1.35@1.45	1.35	1.35	1.35	1.35
Cincinnati (Miami Gr.).....	.90	.85			.85	
Columbus, O. ....		.65	.60	.70	.70	.65
Des Moines, Ia.	50@1.00	.50	1.50	1.50	1.25	1.25
Earlestead, Mich.	55@.60	.55@.60		.75@.90	.75@.80	.75@.80
Elgin, Ill. ....		.30@.40		All gravel, .30@.40		
Escanaba, Wis.		1.20	1.20	1.20	1.00	1.00
Fort Dodge, Ia.		1.00	1.75		1.75	
Grand Rapids, Mich. ....	.40	.45	1.00	.60	.70	.67
Hawarden & Doon, Ia. ....		.50		(1.20, Hawarden)		1.00
Illinois, Northern.....	.60	.60@.70	.60@.75	.60@.70	.60	.50@.60
Indianapolis, Ind. ....	.50	.50		.65	.65	.65
Janesville, Wis. ....		.50			.60	
LeMars, Ia. ....		.60				1.10
Mason City, Ia. ....	.60	.50	1.45	1.35	1.30	1.25
WESTERN:						
Milwaukee, Wis. ....		.40	1.25	1.15	1.10	1.00
Minneapolis, Minn. ....	.40	.75	.85	.75	.75	.75
Montezuma, Covington, Ind. ....	.75	.65	1.15	1.05	.95	.95
Oxford, Mich. ....		.95	2.10	2.00	1.85	1.70
Saginaw, Mich. ....	.75	.75	.75	.75	.75	.75
Summit Grove, Ind. ....	.75	.75			.75	.75
Terre Haute, Ind. ....	.75	.75			.75	.75
Toledo, O. ....			.60 for all sizes			
Wabash Valley District, Ind.			All sizes, .75.			
Waupaca, Wis. ....		.35	.70	.70	.70	.70
Winona, Minn. ....		.70	1.10	1.10	1.10	1.10
SOUTHERN:						
Charleston, W. Va. (River)....		1.20	1.30	1.30	1.30	1.30
Lake Weir, Fla. ....	.50					
Knoxville, Tenn. ....	.90	.90		1.50	1.50	1.25
Pelzer, S. C. ....	.55					
Valde Rouge, La.		1.00*	2.25*	2.10*	1.75@2.00*	
Waco, Tex. ....	.75	.75	1.20	1.20	1.00	1.00
WESTERN:						
Kansas City, Mo. ....	.60	.60				
Pueblo, Colo.	1.00	.75			1.75	
Roche Spur, Tulare Co., Cal. ....			.35 River sand 1/4 inch			
St. Louis, Mo.	1.20@1.35	1.20@1.25	1.50@1.75	1.30@1.40	1.25@1.40	1.25@1.35
San Francisco, Cal.			1.15 for all grades gravel.			
Seattle, Wash.	1.25*	1.25*	2.00*	1.25*	1.25*	1.25*
Sherman, Mo. ....	.65	.90	.90	.70	.70	.65

Bank Run Sand and Gravel

City or shipping point	Fine Sand, 1/10 inch down	Sand, 1/4 inch and less	Gravel, 1/2 inch and less	Gravel, 1 inch and less	Gravel, 1 1/2 inch and less	Gravel, 2 inch and less
EASTERN:						
Attica, N. Y. ....	.50	.50	.50	.60	.60	.60
Boonville, N. Y. ....	.40@.55	.40@.55		.60		.45@.60
Burnside, Sand Pit, Conn.	All sand, .80	cu. yd.				
Pittsford, N. Y. ....		.45@.50	.45@.50			
Yardville, N. J. ....		.50@.75				
York, Pa. ....		.80@1.10				
CENTRAL:						
Beloit, Wis. ....		.60			.60	
Cleveland, Ohio.			1.00@1.25 bank sand			
Covington, Ind. ....					.60	.60
Des Moines, Ia.			Washed concrete mix, 25% gravel, .70; 50% gravel, .90		.65@.80	.65@.80
Earlestead, Mich. ....				.65@.80		
Escanaba, Mich. ....			.85 for all sizes			
Grand Rapids, Mich. ....	.30					.40
Indianapolis, Ind.			Washed concrete mix, .55			
Janesville, Wis. ....					.55	
Moline, Ill.		1.50*			1.75*	
Oxford, Mich. ....	.65*	.65*	.85*	1.40*	1.30*	1.30*
Portsmouth, Ohio. ....		.65	.85	.85		
Saginaw, Mich.—(River dock).....		1.05	1.20	1.20	1.20	1.20
Summit Grove, Ind. ....			.50 for all sizes			
Terre Haute, Montezuma, Ind.			Road Gr., .50; Concrete, .60			.55@1.00
Toledo, Ohio. ....			.75 for all sizes			
Wabash Valley District, Ind. ....						.40
Waupaca, Wis.						
Winona, Minn.			Pit run gravel under 2-in., .70			
SOUTHERN:						
Howcott, La. (50% and up in rock content).....						.65
Knoxville, Tenn. ....	.90					
Lindsay, Tex.		1.15			.44@1.00	
Memphis, Tenn. ....	.65@.90	.65@.90			.85@1.10	.85@1.10
Rosenberg, Tex.	1.35*	.50@.75*				1.75*
Valde Rouge, La.			Sand and gravel mixed for concrete, .85@1.10			
WESTERN:						
Kansas City, Mo.	1.00	1.00				
Pueblo, Colo.			River Run .75 unscreened			1.40
St. Louis, Mo.						

* Cubic yard. B Bank. L Lake. || Ballast.

General News From the Rock Products Markets

Prices of Domestic Magnesite Declining

CONDITIONS REMAIN, for the most part, unchanged in the magnesite industry. The great bulk of calcined magnesite is used for refractory purposes in the steel and copper industries, in the form of so-called "dead-burned." Caustic magnesite, which is not burned to so great a degree as that used in open-hearth steel manufacture, is used principally for flooring purposes. Other uses for magnesite, or magnesite products, are in the manufacture of insulating or non-conducting material and for chemical and medicinal purposes.

The quiet condition in the steel and building trades has been reflected naturally in the magnesite business, and the larger consumers report operations at only fractional capacity. About the middle of March the price of magnesite brick dropped from \$90 to \$70 per net ton, and a drop from \$37.50 to \$32.50 per net ton for dead-burned magnesite at Washington points was reported.

Gypsum Wall Board Prices

THE PRICES ON GYPSUM WALL board recently announced as having been set by a price-fixing committee of the Government do not apply to present or future business. They apply only to material bought by the Government during the war and are to replace the tentative prices at which the material was delivered in the final adjustment and settlement of accounts.

Phosphate Rock Market

THERE WAS LITTLE CHANGE in the phosphate rock market during the month of March. Labor costs are one

of the principal items in the mining and preparation of phosphate rock and there has been no change in labor costs; hence there has been no marked change in the price of this important fertilizer commodity. Florida land pebble, containing 68 per cent bone phosphate, f. o. b. Tampa, Fla., was about \$5 per ton; with 75 per cent bone phosphate, the price was \$7.50 to \$8 per ton; high-grade Florida hard rock, containing 77 per cent bone phosphate, f. o. b. Florida ports, was \$9 to \$10 per ton. Tennessee rock guaranteed to contain 75 per cent bone phosphate of lime averaged \$9.50 to \$10. The Tennessee rock with 58 to 72 per cent bone phosphate of lime, ground so that it will pass through a 100-mesh screen, was priced at \$7.25 to \$7.50 per ton.

Own Your Own Home Bureau Now a U. S. Function

THE NATIONAL FEDERATION of Construction Industries in its second News Letter announces the creation of a National "Own Your Own Home" Bureau as a division of the U. S. Department of Labor. The bureau is composed of representatives of the Association of Real Estate Boards and the U. S. League of Local Building and Loan Associations.

The National "Own Your Own Home" Bureau will operate as a Government agency. A complete plan of campaign is now ready for distribution to those who are interested. Requests should be sent to National "Own Your Own Home" Bureau, care Department of Public Works and Construction Development, Department of Labor, 1607 H St., N. W., Washington, D. C.

Persons who are interested in the work of the National Federation of Con-

struction Industries should communicate with its general offices at 757 Drexel Building, Philadelphia, Pa.

Price Reductions in Iron and Steel but Not in Ore

THE REDUCTIONS in iron and steel prices, ranging from \$7.25 to \$15 per ton, announced March 25, should not be taken in any sense as indicating that like reductions can be made in rock-product building materials. The iron and steel industry enjoyed an unparalleled prosperity and paid dividends all the way from 15 to 100 per cent during the war. Naturally the manufacturers can hardly expect to prolong the picnic beyond the time they cease to deal with the public *en masse* and commence to do business with individuals.

A very noteworthy feature of the price cut was the fact that the prices of Michigan and Minnesota ores have not been reduced. Here we have a case similar to the products of the quarry and pit. The more times a product is handled the greater profit on each successive handling. The producer of the raw material has in no case made even fair profits and there is no chance or probability of price reductions, in the rock-products industries at least.

Missouri Governor Wants Royalty from River Sand Dredgers

JEFFERSON CITY, MO.—Gov. Gardner wants a law that will permit the state collecting a royalty on all sand and gravel removed from navigable streams, he recently told newspaper men called in conference with him.

He denied knowledge of or sanction to a bill killed by the house and senate committees that would create a "Missouri Drainage, Waterways and Conservation Commission," for the administration of the sand tax the measure provides, and which would create three \$5,000 positions and other jobs.

The bill drawn to meet the governor's ideas creates no new positions and would be administered through the land reclamation department now existing. It would impose a royalty of 5 cents per cu. yd. on sand and gravel taken from navigable streams in the state instead of 10c. per ton as provided in the dead bill.

Other states, says the St. Joseph Gazette, are said to have found sand royalties good sources of revenue and the Kansas law has been upheld by the Supreme Court of the United States. Oklahoma even collects a royalty on oil taken from under the beds of navigable streams.

Ground Gypsum Rock, per Ton, at Plant

Fort Dodge, Ia.	6.00	Centreville and Glover, Tenn.—B. P. L., 72% lump rock, ton, 2,240 lbs.	6.00@6.50
Garhutt, N. Y.	6.00	Mt. Pleasant, Tenn.	7.00@8.50
Grand Rapids, Mich.	6.00	Mt. Pleasant, Tenn.—B. P. L., 70% washed (90% thru 100 mesh)	9.00
Oakfield, N. Y.	6.00	In 200 lb. burlap bags, 2.50 extra.	
Sandusky, O.	6.00		

Jute sacks, \$3.00 extra; paper, \$1.00 extra.

Crushed Slag Wholesale at Plant Per Ton

City or shipping point	Roofing	Screenings, ¼ inch down	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
EASTERN:						
Buffalo, N. Y.	1.45					
E. Canaan, Conn.	3.00	1.00	3.00	1.15	1.10	1.00
Ensley, Ala.	2.05	.90		.90@1.20	1.00	.85
Philadelphia Dist.	2.00@2.50	.75	1.50	.85	.85	.85
Pittsburgh Dist.	2.00@2.50	1.00	1.50	1.00	1.00	1.00
Sharpville, Pa.	1.75	1.00	1.25	1.00	1.00	1.00
WESTERN:						
Chicago, Ill.				All sizes, \$1.50, F. O. B. Chicago		
Detroit, Mich.				All sizes, 1.65, F. O. B. Detroit		
Toledo, O.				All sizes, 2.00, F. O. B. Toledo		
Youngstown, Dover, Hubbard, Leetonia, and other Ohio points	1.75	1.00	1.25	1.00	1.00	1.00

New Indiana Legislation Promotes Good Roads

INDIANAPOLIS, Ind.—The Highway Commission Bill and the County Unit Bill have been passed by the legislature. Both of these pieces of legislation will greatly stimulate road construction in this state. A beginning can now be made on 50 miles of roads which had already been planned, surveyed and approved by the Bureau of Roads of the Federal Government. Under the provisions of the Highway Commission Bill, the Federal allotment of about \$1,000,000 for 1918 and the 1919 allotment will be available for use in road building. There are 889 miles of market highways laid out.

The Highway Commission Bill provides for a system of roads which shall reach every county seat and every city of more than 5,000 inhabitants.

The County Unit bill provides that townships may now bond to the limit and receive aid from the county.

March Building Contracts Exceed Average of Last Six Years

WASHINGTON, D. C.—Contracts let in March for building and construction projects will be in excess of the normal average for March in money value. The statement is made on the authority of the Division of Public Works and Construction Development of the U. S. Department of Labor which issued figures on the contracts let in territory east of the Missouri and north of the Ohio rivers, for the first three weeks of March, together with an estimate for the remainder of the month.

The total number of contracts let for the third week in March was 1,945, representing a money value of \$39,017,308. The New York district reported 186 projects involving \$8,372,682; Pittsburgh, 163 projects involving \$5,063,614; Boston, 443 projects involving \$2,602,000. The Chicago district reported 741 contracts let, involving \$19,212,298.

The record for the first three weeks of March was:

Week ending March 7, 1919.....	\$27,751,076
Week ending March 14, 1919.....	29,851,407
Week ending March 21, 1919.....	39,017,308
Total	\$96,619,791

From these figures has been omitted the Minneapolis district from which the total would be less than one million dollars.

It appears likely that the entire month's figures will be between \$125,000,000 and \$150,000,000. The amount involved in contracts awarded in January of this year was about \$51,000,000 and in February about \$95,000,000; from which it appears the construction business certainly is "picking up."

Theodore Roosevelt said:

"THE wage worker should not only receive fair treatment; he should give fair treatment.

"In order that prosperity may be passed around, it is necessary that the prosperity exist.

"In order that labor shall receive its fair share in the division of reward, it is necessary that there be a reward to divide."

Figures for the month of March for several years, to the nearest million dollars, are as follows:

1911.....\$ 69,000,000	1915.....\$ 76,000,000
1912.....73,000,000	1916.....95,000,000
1913.....64,000,000	1917.....133,000,000
1914.....59,000,000	1918.....116,000,000

Index figures have been compiled as carefully as the nature of the case would permit, for the general cost of construction for the years from 1913 on, and the figures for these years have been converted into the cost in 1918, or the present time. Results, in round numbers, are:

1913.....\$ 94,000,000	1916.....\$132,000,000
1914.....89,000,000	1917.....153,000,000
1915.....118,000,000	1918.....116,000,000
Average of the six years, \$117,000,000	

Outlook for Cement Among Canadian Companies

TORONTO, Ont.—F. P. Jones, general manager and vice-president of the Canada Cement Co., member of the Canada Trade Commission, speaking on the outlook of the Canadian cement industry stated that there are prospects that the British West Indies market can be developed considerably. Expectations of expansion of business in this direction would appear to be justified but it is not considered that the market will be a large factor in the Canadian cement industry.

The domestic consumption this year is expected to be considerably above the record of the last three years, taking into account the program of public works both as to Government buildings and as to canal and harbor construction. Road building activities during the coming season will also be much more extensive than was the case during the war. Farmers have been inquiring for cement for construction work that was postponed. In spite of the tendency to hold off from the larger construction undertakings, there are a large number of projects which cannot be longer deferred.

While the outlook for 1919 is for a resumption of construction on a larger scale than hitherto, there are few prophets of a boom year. Under these conditions some export business could be done, in addition to supplying the demands of the home market.

The Knockers!

THE PRICE-INVESTIGATION of the Illinois legislative committee at Chicago is not without interesting sidelights. While the brick manufacturers were on the stand a reporter states:

"The matter of road-making materials was gone into. The life of a concrete road is from three to six years, witnesses testified."

"It has been testified here," said Chairman Dailey, "that a good road may be made out of brick; that brick does not need a concrete foundation. This information is very important to the highway department of the state. Under the \$60,000,000 road bond issue it has been assumed that we would build concrete roads and that we would have to pay the prices the cement men decide to charge. This testimony shows that there is a big upkeep cost to this kind of a road and may open the way for a new deal for the state."

This reminds us of the old saying about cutting off one's nose to spite the face.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912.

Of Rock Products published every other week at 542 S. Dearborn St., Chicago, Illinois, for April 1, 1919.

State of Illinois, County of Cook.
Before me, a Notary Public in and for the State and county aforesaid, personally appeared W. D. Callender, who, having been duly sworn according to law, deposes and says that he is the business manager of the Rock Products and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation, etc.), of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse of this form, to-wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, Trade Press Publishing Corporation. Editor, Nathan C. Rockwood. Managing editor, Nathan C. Rockwood. Business managers, W. D. Callender and A. Perrin, all at 542 S. Dearborn St., Chicago.

2. That the owners are: (Give names and addresses of individual owners, or if a corporation, give its name and the names and addresses of stockholders owning or holding 1 per cent or more of the total amount of stock.) Trade Press Publishing Corporation, W. D. Callender, Geo. P. Miller, T. J. Sullivan, A. Perrin, N. C. Rockwood and Fred D. Porter, all at 542 S. Dearborn St., Chicago.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) There are none.

4. That the two paragraphs next above giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

(Signed) W. D. CALLENDER,
Business Manager.

Sworn to and subscribed before me this 24th day of March, 1919.
MICHAEL J. O'MALLEY, Notary Public.
(My commission expires March 8th, 1920.)



Passed By The Screens



Incorporations

E. M. Good Sand & Stone Co., Havre de Grace, Md., purchased property near Conowingo and will install plant for stone crushing, etc.

Traill Sand & Gravel Co., Grand Island, Hall County, Neb. Capital, \$250,000. Incorporators, James W. Traill and David J. Traill.

Pine Valley Sand Co., Wilmington, N. Y. To acquire lands containing gravel, sand, clay, etc. Capital, \$450,000.

The Laubis Stone Co., Kenton, O., recently incorporated for \$10,000, elected F. J. Laubis, president; C. L. Wolf, vice president; L. H. Ramge, treasurer; C. W. Taylor, secretary.

Buffalo Gravel Corporation, Buffalo, N. Y., capitalized at \$250,000. The incorporators are James N. Carroll, Samuel J. Dark, David Hyman, Daniel E. Knowlton and Morris S. Tremaine.

Federal Cement Co., New York. Capital, \$1,000,000. To manufacture, sell and deal in and with cement of all kinds. L. M. Rosebaum, L. Reim, J. D. Rosebaum, all of New York.

Hipp Refractories Co., Canton, O.; \$125,000; R. T. Hipp, K. B. Hipp, A. Evans, O. P. McDonald, M. E. Storrie. Fireclay, refractory cement, etc.

Colwell Sand & Gravel, Ltd., Toronto, Ont., has been incorporated with the following provisional directors: W. S. Morlock, S. E. Wedd and S. D. Fowler.

The Crowley Ridge Gravel Co., Crowley Ridge, Little Rock, Ark. Capital, \$10,000. P. J. Lewelling, president; Lena Price-Williams, vice president, and Vernon Price-Williams, secretary and treasurer.

Cameron Clay Products Co., Emporium, Pa., manufacturer brick, tile and cement and other products from shale and limestone. Incorporators, Lloyd R. Wilson, Ralph W. Touzeau and Jay P. Felt. Atty. Mark A. Copeland, solicitor.

Seguine & Co., Upper Mt. Bethel, Pa., to conduct a quarrying business. Capital, \$18,000. Directors are Hattie Seguine, Kenvil, N. J.; William S. Seguine, Kenvil, N. J.; Frank B. Beck, Mt. Bethel, and W. J. Young, of Easton.

Independent Granite Co., St. Cloud, Minn. Quarrying granite, marble, stone and rock and manufacturing same into building material, tombstones, etc. Capital, \$50,000. Incorporators, directors and officers: Charles T. Schmid, president; Lawrence Kruger, first vice-president; Mathias W. Mueller, second vice-president; Henry Emmerich, secretary; Mathias Leisen, treasurer; all of St. Cloud.

Application for a charter has been made by the Mineral Products Co., New Castle, Pa., organized for the purpose of dealing in sand, gravel, clay, brick and other minerals in Pennsylvania, Ohio and New York. The incorporators are Attorney Roy W. Hazen, John A. Edgar and David Kay. Capital stock is \$10,000. The company will operate as a jobbing concern at first but later expects to acquire plants. Offices will be in the Dean building with Attorney Roy Hazen, in charge.

Sand and Gravel

The Raymond Concrete Pile Co., 10 Cathcart St., Montreal, want prices on sand, gravel and crushed stone, f. o. b. Fort William, Ont.

The New Martinsville Sand Co. of New Martinsville, W. Va., recently incorporated for \$50,000, has purchased seven acres on the B. & O. railroad. Plant construction will begin at once. A modern sand dredge and a number of barges have been bought. Sand will be taken from the river.

The Saskatchewan Gravel & Sand, Ltd., of Regina, Sask., incorporated a few months ago, is operating pits at Victoria Plains and Pilot Butte, Sask., and shipping pit run material only at present. H. H. Perrin, secretary and manager, writes that the company is interested in loading machinery and in screens with a view to purchase. W. R. Mackenzie is president.

The Wissota Sand and Gravel Co. of Eau Claire, Wis., has begun the construction of its plant on the shore of Lake Wissota near Chippewa Falls, Wis., and operation will begin at the earliest possible day to supply material for the proposed Chippewa Falls-Eau Claire concrete

highway and the hydro-electric development work on the Chippewa River. The capacity of the plant will be 15 to 20 cars a day. The company was organized recently with a capital of \$30,000. The following are the officers: President, L. G. Arnold; Vice-President, Andrew Larson; Secretary, P. O. Wollum; Treasurer, C. W. Dinger.

Cement

The St. Mary's Cement Co., St. Mary's, Ont., is enlarging its plant.

The Board of Review of the War Department has approved the contracts awarded the Whitehall Portland Cement Co., Philadelphia, for cement for the Philadelphia Quartermaster Terminal, to cost \$113,437.80, and for cement for the Raritan Arsenal in New Jersey, to cost \$1,155.

The Montreal Portland Cement Co., Ltd., has been incorporated with a capital of \$2,000,000 by John MacNaughton, lawyer, Robert Houston, James G. Cartwright, James B. Taylor and Andrew MacIntyre, managers, all of Montreal. They will manufacture cement by a new secret process. A site has been purchased on the island of Montreal and building operations on a large modern plant will be commenced immediately. Robert Dodd is the Montreal representative.

Lime

Two new Clyde lime hydrators have recently been installed at the plant of the Nast Brothers Lime Co., Eden, Wis.

The offices of the Northern Lime Co., Petoskey, Mich., were gutted by fire, causing a considerable loss. The interior of building was burned away and records much damaged. Blaze started from furnace.

The erection and installation of additional machinery, costing approximately \$20,000, is reported at the plant of the Portersville Magnesite Co., Portersville, Cal. Daily shipments out of Portersville averaged about two carloads daily during February. The building of the McKnight Fire Brick Company's plant at Portersville is expected to stimulate the magnesite business in that section.

Phosphate

The Florida Hard Rock Phosphate Export Association was formerly organized in Ocala, Fla., March 19. Officers elected were Ralph Barker, of the Dunnellon Phosphate Co., president; George F. Armstrong, of the Mutual Mining Co., and Clarence Camp, of C. & J. Camp, vice-presidents; W. E. Cummer, of the Cummer Lumber Co., secretary and treasurer. This association is formed exclusively as an export association under the Webb-Pomerene law, and represents virtually all hard-rock mining interests of Florida. As this association became operative immediately, large exports of phosphate will probably be commenced in the near future.

Potash

Work has been started on a \$2,000,000 plant, covering about 20 acres of land, at Millville, N. J., near Perth Amboy, by the Eastern Potash company, 120 Broadway, New York. T. C. Meadows is the general manager. It has a small plant in operation at Haverstraw, N. Y.

The potash market is dull, and practically all of the Nebraska plants are closed down. Very little information is available as to sales, although prices of from \$3.50 to \$3.75 per unit, delivered at the eastern market, are reported.

Quarries

H. E. Bester of Hagerstown, Md., is operating his quarry now for the railroad company which is using the output for ballast.

A ton of dynamite was used in a recent blast at Corson's limestone quarry, Plymouth Meeting,

Pa., when about 11,000 tons of rock were loosened. The breast, into which eight holes were drilled, was 144 feet across.

Personals

Parker M. Lewis of the American Sand & Gravel Co., recently returned from extended trips, including journeys to Cuba and Florida.

John G. Stewart, who has been associated with the Stephens-Adamson Manufacturing Co. for 15 years, has been appointed district manager, in charge of the new sales office in Cincinnati, O., where personal engineering attention will be given to this particular territory.

Walter B. Elcock has returned as District Engineer in charge of the Atlanta office of the Portland Cement Association. Mr. Elcock has lately been relieved of his duties as Major of Infantry and Adjutant of the 157th Depot Brigade at Camp Gordon. He was in charge of the Atlanta office of the Portland Cement Association when he entered military service in March, 1917.

J. P. Yoder, formerly special examiner of the Federal Trade Commission, was sworn in April 1 as secretary to the commission to succeed Leonidas L. Bracken, who resigned recently to resume the private practice of law. Yoder left the commission in February, 1918, being commissioned a captain in the army Sanitary Corps. He has but recently returned from service in France. Prior to his former connection with the commission, Yoder was manager of the Washington bureau of one of the large press associations.

Raymond W. Dull, head of The Raymond W. Dull Co., which was recently absorbed by the Link-Belt Co., is retained by the later company as consulting engineer. He maintains his office in the Conway Building, Chicago, where he conducts his own business as consulting engineer for sand and gravel companies. Otherwise the whole staff of the Dull company is now established in the Link-Belt quarters. Edward E. Dull is in the engineering department; C. S. Huntington is head of the sand and gravel department, and A. R. Pfeffer is in the sales department.

J. S. Vrabek, former western sales manager of the Sturtevant Mill Co., has been promoted to eastern sales manager, and is ably assisted by D. Kantor. Mr. Vrabek is a comparatively young man yet he is old in experience having served the Allis-Chalmers Company for many years in Boston, Milwaukee and Salt Lake City, while for the past 7½ years he has been an unqualified success as western sales manager for the Sturtevant concern with headquarters in Chicago. Owing to Mr. Vrabek's intimate knowledge of the cement business he will have charge of the sales of equipment for cement plants throughout the entire country. His office will be in the new quarters of the company in the Singer Building, New York City.

Lieut. Commander H. J. Elson, U. S. Naval Reserve Force, has been released to inactive status and has resumed his civilian work as secretary and treasurer of Walter A. Zelnicker Supply Co., St. Louis, with which company he was in charge of internal management and manufacturing operations. Lieut. Commander Elson was graduated from U. S. Naval Academy in 1898 and after service in Cuba, the Philippines and China, became interested in 1902 in the Zelnicker company. He was chief engineer of the Missouri Naval Militia. His assignment was inspector of machinery 9th, 10th and 11th Naval Districts, with headquarters at Chicago, where he had charge of the design and conversion to salt water use of Great Lakes vessels taken over by the Navy Department.

OBITUARY

Edward John Stamm, president of the St. Louis Cut Stone Co., died at his home in that city two weeks ago. Heart disease, with which he was troubled for several years, was the cause of his death. Mr. Stamm was 68 years old and a native of St. Louis. He began his career in the stone business as a stone cutter for the Jacob Pickel Brothers Stone Co., of St. Louis. He became manager of the plant in 1873. Five years later Mr. Stamm went into business for himself. He organized the St. Louis Cut Stone Co., in April, 1890, and until the time of his death was president of the firm. During recent years Mr. Stamm's sons have managed the business.